

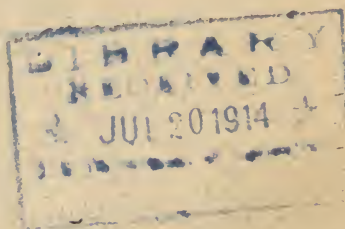
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U. S. DEPARTMENT OF AGRICULTURE.

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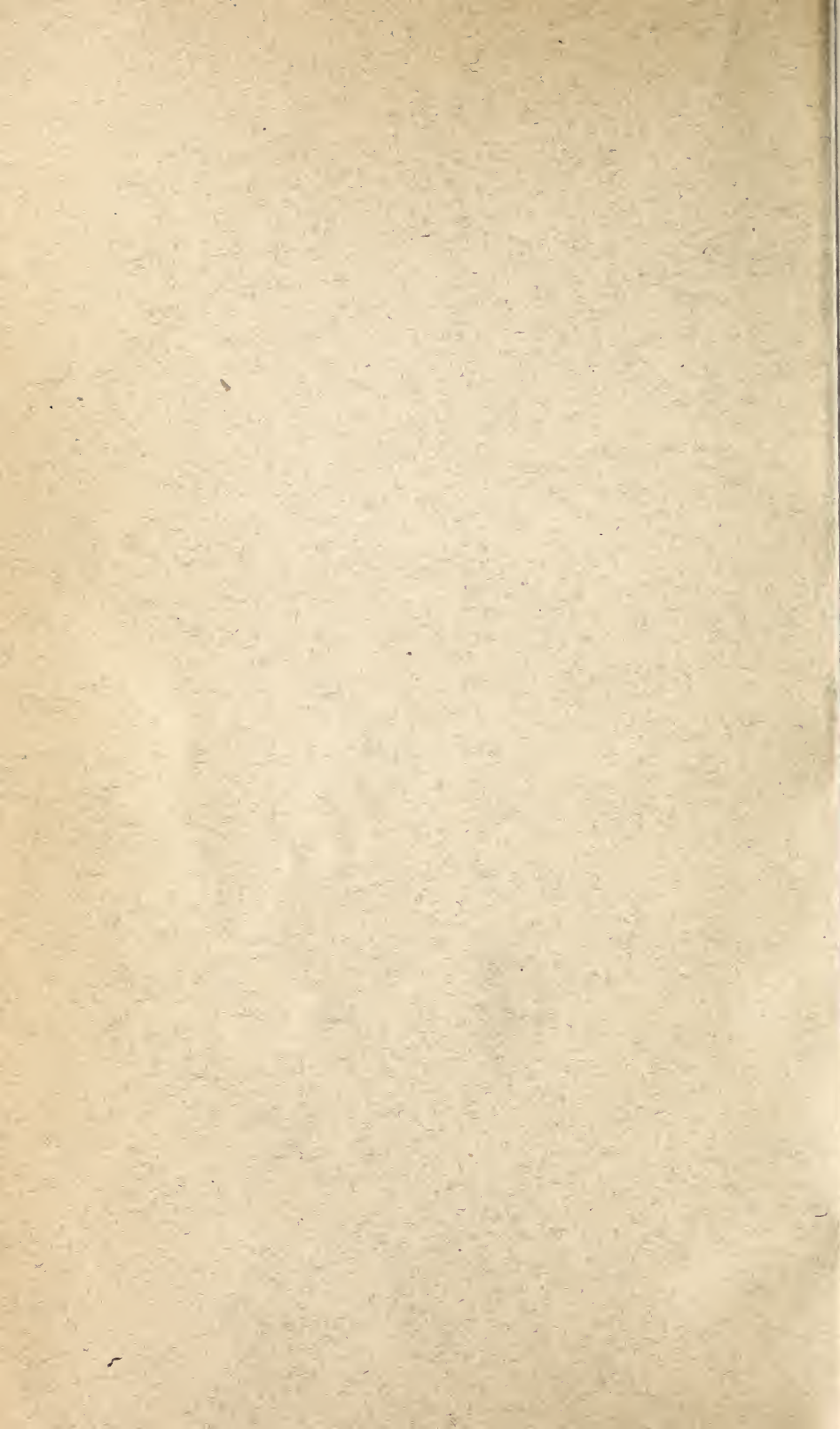
LIST OF WORKERS IN
SUBJECTS PERTAINING TO AGRICULTURE AND
HOME ECONOMICS IN THE U. S. DEPART-
MENT OF AGRICULTURE AND IN THE
STATE AGRICULTURAL COLLEGES AND
EXPERIMENT STATIONS.



CORRECTED TO JUNE 1, 1914.



WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1914.



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List of Workers in Subjects Pertaining to Agriculture and Home Economics in the U. S. Department of Agriculture and in the State Agricultural Colleges and Experiment Stations.

UNITED STATES DEPARTMENT OF AGRICULTURE.

(Prepared in the Division of Publications,
JOS. A. ARNOLD, *Chief*.)

OFFICE OF THE SECRETARY.

Secretary of Agriculture, DAVID F. HOUSTON.

The Secretary of Agriculture is charged with the work of promoting agriculture in its broadest sense. He exercises general supervision and control over the affairs of the department and formulates and establishes the general policies to be pursued by its various branches and offices.

Assistant Secretary of Agriculture, BEVERLY T. GALLOWAY.

The Assistant Secretary of Agriculture becomes Acting Secretary in the absence of the Secretary and assists in the general supervision of the work of the department. He is also charged with certain special duties, which include direct supervision of (1) the scientific and technical investigations of the department; (2) miscellaneous clerical and minor changes in the personnel of the department; (3) the publication of results of investigations and experiments; (4) preparation of annual reports and estimates.

Chief Clerk, ROBERT M. REESE.

The Chief Clerk has general supervision of clerks and employees; of the order of business and of the records and correspondence of the Secretary's office; and of expenditures from appropriations for contingent expenses, stationery, etc. He is responsible for the enforcement of the general regulations of the department and is custodian of the buildings.

Office of the Solicitor. FRANCIS G. CAFFEY, *Solicitor*.

The Solicitor is charged by law (act of May 26, 1910) with the direction of the legal work of the department. Accordingly, he acts as legal adviser to the Secretary and the heads of the several branches of the department, conducts its legal work, and represents it in all legal matters. He approves, in advance of issue, all orders and regulations promulgated by the Secretary under statutory authority.

General office administration; preparation of briefs, enforcement of cattle quarantine laws, and plant quarantine act; legal opinions to the Rural Organization Service and Office of Markets; miscellaneous legal matters.

W. P. JONES, *Assistant to the Solicitor, in charge.*

This section attends to legal matters connected with the acts of May 29, 1884, February 2, 1903, and March 3, 1905, relating to the importation, exportation, and interstate transportation of diseased live stock, the plant quarantine act of August 20, 1912, and the Rural Organization Service and Office of Markets. General administration of the office and miscellaneous legal matters are also assigned to this section.

Law work of the Forest Service. R. W. WILLIAMS, Assistant to the Solicitor, in charge.

The legal work of the Forest Service falls under four headings, as follows:

Claims: Contests arising out of claims to lands in the national forests under homestead, mineral, and other laws.

Trespasses: Cases arising out of timber, fire, fencing, and other trespasses on the national forests.

Opinions: The furnishing of legal opinions to the Forester and review of opinions written by district law officers to be presented to district foresters.

Miscellaneous: Various legal matters connected with the national forests, such as contracts, forms, etc.; reports to the Secretary on proposed action; correspondence with the Attorney General and the Comptroller of the Treasury; and replies to inquiries addressed to the department.

Enforcement of the food and drugs act. W. C. HENDERSON, Assistant to the Solicitor, in charge.

This section prepares cases arising under section 2 of the food and drugs act, June 30, 1906, for submission to the Attorney General; handles seizures under section 10; prepares cases for trial; and prepares notices of judgment for publication under section 4.

Contract work, enforcement of the meat-inspection law and the 28-hour law; patents. C. W. BOYLE, Assistant to the Solicitor, in charge.

This section draws agreements and leases; prepares cases arising under the meat-inspection law for submission to the Attorney General, including briefs; and prosecutes applications of employees of the department for patents to be dedicated to the public.

Enforcement of the insecticide act. O. H. GATES, *Assistant to the Solicitor, in charge.*

This section prepares cases arising under section 2 of the insecticide act of April 26, 1910, for submission to the Attorney General; handles seizures under section 10; and prepares notices of judgment for publication under section 4. The compiling and revising of the Laws Applicable to the United States Department of Agriculture is intrusted to this section.

Acquisition of lands under the Weeks forestry law. A. H. McCONVILLE, *Assistant to the Solicitor, in charge.*

In connection with the acquisition of lands under the act of March 1, 1911, this section prepares contracts, supervises the work of record examiners, and handles correspondence with the Attorney General.

Assistants to the Solicitor, stationed in the field.

Branches of the Office of the Solicitor located at Missoula, Mont.; San Francisco, Cal.; and Portland, Oreg., have each two assistants to the Solicitor; the branch offices at Denver, Colo., Albuquerque, N. Mex., and Ogden, Utah, each has one assistant to the Solicitor. These men are legal advisers to the district foresters and handle the legal work of the Forest Service in the field, besides such local legal work of the department as may be assigned by the Solicitor.

Assistants in the field.—G. E. Trowbridge, D. F. McGowan, H. P. Dechant, W. F. Staley, J. F. Lawson, J. O. Seth, Maury Curtis, and E. C. Arnold.

Office of Information. G. W. WHARTON, *Chief.*

The Office of Information is established to secure the widest possible circulation for the discoveries and recommendations of the scientists, specialists, and field workers of the department. It gives out to the public press facts taken from publications, and also from oral statements of specialists. Material so disseminated is set forth in such form as to attract attention and lead to the adoption of the methods recommended. A Weekly News Letter to Crop Correspondents is published, and also each month during the crop season an agricultural forecast outlining the crop prospects.

Office of Markets. CHARLES J. BRAND, *in charge.*

The Office of Markets is making a special study of market conditions, methods of grading, standardizing, packing and shipping, and the nature of the commercial transactions by means of which farm produce gets from the farm to the consumer.

Forest Appeals. THOMAS G. SHEARMAN, *in charge.*

This officer investigates for the Secretary of Agriculture appeals from decisions of the Forest Service, and reports his findings to the Secretary.

Rural Organization Service. T. N. CARVER, *Director.*

The Rural Organization Service is designed to promote business organizations among farmers, not only in the field of marketing, but also in that of finance, insurance, cooperative buying, and cooperative production. As preliminary work a careful study is being made in the field to find out what forms of organization have been tried, under what conditions they have succeeded, and under what they have failed. This information is to be available for the use of farmers who desire to organize themselves into business associations.

The Division of Rural Finance, under Mr. C. W. Thompson, is making a survey of credit facilities and credit needs of farmers in different sections of the country.

The Division of Producers' and Purchasers' Associations, under Mr. L. H. Goddard, is making a similar survey in this field.

Appointment Clerk, R. W. ROBERTS.

The Appointment Clerk prepares all papers connected with appointments, transfers, promotions, reductions, details, furloughs, and removals, and has charge of correspondence with the Civil Service Commission. He is the custodian of oaths of office, personal reports, and efficiency reports. He has the custody and use of the department seal.

Office of Exhibits. F. LAMSON-SCHRIENER, *Special Agent on Exhibits.*

The Office of Exhibits handles the correspondence of the department relative to exhibits at fairs and expositions of various kinds; cooperates with the several branches of the department in preparing exposition material; ships, installs, and cares for such exhibits; and investigates methods of displaying them.

WEATHER BUREAU.

Chief, CHARLES F. MARVIN; *Assistant Chief,* HENRY E. WILLIAMS; *Chief Clerk and Executive Assistant,* C. C. CLARK.

The Weather Bureau has charge of the forecasting of the weather; the issue and display of weather forecasts and storm, cold-wave, frost, and flood warnings; the gauging and reporting of river stages; the maintenance and operation of the United States Weather Bureau telegraph and telephone lines; the collection and transmission of marine intelligence for the benefit of commerce and navigation; the reporting of temperature and rainfall conditions for agricultural interests; and the taking of such meteorological observations as may be necessary to determine and record the climatic conditions of the United States.

Forecast Division. HENRY E. WILLIAMS, *in charge.*

This division receives and charts, twice daily, telegraphic reports of the prevailing weather conditions and issues a statement of impending weather changes in all parts of the country. In the case of severe disturbances warnings are issued to special storm-warning stations along the Lakes and the seacoast.

River and Flood Division. ALFRED J. HENRY, *in charge*.

This division gives information as to stages of water along the navigable rivers and issues flood warnings. It gathers information on the depth of snowfall in the mountains of the West, for a study of the flow of water in the streams supplying irrigation projects, and on the rate of evaporation from ponds and lakes, in the interest of water storage for irrigation, power development, and navigation. It supervises, on the part of the Weather Bureau, the experiment stations maintained jointly by the Weather Bureau and the Forest Service.

Climatological Division. P. C. DAY, *in charge*.

This division has charge of and supervises the work of about 4,200 cooperative stations, 42 special meteorological stations, and about 400 special stations maintained in connection with the corn, wheat, cotton, sugar, rice, tobacco, and fruit industries. From these are collected the records of daily observations of temperature, precipitation, and other meteorological conditions necessary to establish a history of the climate of the various portions of the United States. Data showing the current weather conditions throughout the country are collected and published weekly during the principal crop-growing season and monthly during the remainder of the year; also weekly during the winter months, showing the depth of snow on the ground and the thickness of ice in the rivers and harbors. It has charge of the preparation of the climatological portion of the annual reports of the bureau and supervises the monthly and annual summaries and other publications of the climatological service of the various States, including the weather conditions over the great cereal and cotton growing districts. This division has charge of the barometry of the United States and of the preparation of the normals of pressure, temperature, precipitation, etc. It also collates from reports of marine observers meteorological information pertaining to the oceans, and is charged with the supervision of the radiotelegraph weather service of the Atlantic and Pacific coasts.

Instrument Division. BENJAMIN C. KADEL, *Chief*.

Has supervision of the entire meteorological instrumental equipment of the Weather Bureau; including exposures and installations at stations; the purchase, comparison, and adjustment of all new meteorological instruments and apparatus for stock and issue; construction and repair of instruments and apparatus for station equipments. Purchase, installation, and maintenance of automatic, recording, river gauges, and of the storm-warning towers, flags, and lanterns employed at about 300 display stations on the seacoasts and the Great Lakes; including inspection and personnel thereof.

Telegraph Division. THEODORE T. MOORE, *Chief*.

This division receives and transmits all telegrams, arranges and controls telegraph circuits, maintains and repairs United States Weather Bureau telegraph and telephone lines and submarine cables, and examines all telegraph accounts.

Library. CHARLES F. TALMAN, *in charge*.

The library includes standard works of reference and technical books on meteorology and allied sciences and a complete file of the publications of meteorological and climatological services in all parts of the world. A catalogue is prepared of the meteorological contents of all the principal scientific periodicals of the world, including proceedings and transactions of societies. Translations from foreign languages are made in the library. The librarian has charge of the examinations held throughout the bureau for promotion to the scientific grades.

Office of the Editor. CLEVELAND ABBE, *in charge*.

This office edits and supervises the publication of the Monthly Weather Review; it also has general editorial supervision over scientific and semiscientific papers submitted for publication for the bureau, calling attention to such of these as seem appropriate for the Monthly Weather Review or the Journal of Agricultural Research, the daily press, etc. It prepares such summaries and indexes as may be necessary and notes on the progress of meteorology.

Printing Division. ROBERT SEYBOTH, *Chief*.

This division prints and mails the daily weather map and the various charts and miscellaneous printed matter pertaining to the bureau and has the custody of and distributes station forms.

Division of Supplies. BENJAMIN A. BLUNDON, *Chief*.

This division purchases and issues supplies and is charged with the safe-keeping of all property belonging to the bureau.

Stations and Accounts Division. DELOS T. MARING, *Chief*.

This division audits, adjusts, and prepares for payment all accounts and claims against the bureau; prepares advertisements; issues requests for passenger transportation; prepares the annual estimates of appropriations; transacts all business relating to the financial interests of the bureau; and supervises the construction of Weather Bureau buildings outside of Washington, including repairs thereto.

Mount Weather Meteorological Research Observatory, Mount Weather, Va. WILLIAM R. BLAIR, *in charge*.

The observatory carries on an extensive system of observations and experiments along the line of meteorological research. The work includes the exploration of the atmosphere to altitudes of 3 to 10 miles by means of kites and balloons; research in the allied subjects of solar radiation and atmospheric electricity; and the discussion of meteorological observations from the point of view of their relation to solar physics and weather forecasting. The results of these observations and experiments are described in the Monthly Weather Review.

Weather Bureau stations and work outside of Washington, D. C.

This bureau maintains throughout the United States, in the West Indies, and in Hawaii about 200 meteorological stations employing from 1 to 10 men each.

For forecast purposes the United States is divided into districts comprising: (1) The upper Mississippi Valley and the Northwest, Henry J. Cox, Chicago, Ill., in charge. (2) Louisiana, Texas, Arkansas, and Oklahoma, Isaac M. Cline, New Orleans, La., in charge. (3) Utah, Colorado, New Mexico, and Arizona, Frederick H. Brandenburg, Denver, Colo., in charge. (4) California and Nevada, George H. Willson, San Francisco, Cal., in charge. (5) Washington, Oregon, and Idaho, Edward A. Beals, Portland, Oreg., in charge. (6) The remainder of the United States, forecaster on duty, Washington, D. C., in charge. At the first three of the stations named morning forecasts only are prepared and distributed, at the last three both morning and evening forecasts.

For the collection and distribution of climatological data the United States, including Porto Rico and Hawaii, is divided into 44 local sections, which, with the names of the officials in charge and the section centers, are as follows:

Alabama: Patrick H. Smyth, Montgomery.
 Arizona: Robert R. Briggs, Phoenix.
 Arkansas: Henry F. Alciatore, Little Rock.
 California: George H. Willson, San Francisco.
 Colorado: Frederick H. Brandenburg, Denver.
 Florida: Alexander J. Mitchell, Jacksonville.
 Georgia: Charles F. von Herrmann, Atlanta.
 Hawaii: William B. Stockman, Honolulu.
 Idaho: Edward L. Wells, Boise.
 Illinois: Clarence J. Root, Springfield.
 Indiana: Verne H. Church, Indianapolis.
 Iowa: George M. Chappel, Des Moines.
 Kansas: Thorp B. Jennings, Topeka.
 Kentucky: Ferdinand J. Walz, Louisville.
 Louisiana: Isaac M. Cline, New Orleans.
 Maryland and Delaware: Oliver L. Fassig, Baltimore, Md.
 Michigan: Charles F. Schneider, Grand Rapids.
 Minnesota: Ulysses G. Purcell, Minneapolis.
 Mississippi: William E. Barron, Vicksburg.
 Missouri: George Reeder, Columbia.
 Montana: R. Frank Young, Helena.
 Nebraska: George A. Loveland, Lincoln.

Nevada: Harvey S. Cole, Reno.
 New England: John W. Smith, Boston, Mass.
 New Jersey: G. Harold Noyes, Trenton.
 New Mexico: Charles E. Linney, Santa Fe.
 New York: Wilford M. Wilson, Ithaca.
 North Carolina: Lee A. Denson, Raleigh.
 North Dakota: Orris W. Roberts, Bismarck.
 Ohio: J. Warren Smith, Columbus.
 Oklahoma: J. Pemberton Slaughter, Oklahoma.
 Oregon: Edward A. Beals, Portland.
 Pennsylvania: George S. Bliss, Philadelphia.
 Porto Rico: F. Eugene Hartwell, San Juan.
 South Carolina: Richard H. Sullivan, Columbia.
 South Dakota: Samuel W. Glenn, Huron.
 Tennessee: Roscoe Nunn, Nashville.
 Texas: Bernard Bunnenmeyer, Houston.
 Utah: Alfred H. Thiessen, Salt Lake City.
 Virginia: Edward A. Evans, Richmond.
 Washington: George N. Salisbury, Seattle.
 West Virginia: Henry C. Howe, Parkersburg.
 Wisconsin: Henry B. Hersey, Milwaukee.
 Wyoming: Robert Q. Grant, Cheyenne.

BUREAU OF ANIMAL INDUSTRY.

Chief, A. D. MELVIN; Assistant Chief, A. M. FARRINGTON; Chief Clerk, CHARLES C. CARROLL.

The Bureau of Animal Industry has charge of the work of the department relating to the live-stock industry. In general it deals with the investigation, control, and eradication of diseases of animals, the inspection and quarantine of live stock, the inspection of meat and meat-food products, and with animal husbandry and dairying.

Animal Husbandry Division. GEORGE M. ROMMEL, *Chief.*

This division studies the breeding and feeding of farm animals and poultry, and passes upon the pure breeding of animals imported into the United States for breeding purposes. The division is engaged in work in cooperation with the War Department in encouraging the breeding of horses for military purposes. It studies also the cost of production of poultry and eggs, methods of improving the quality of farm eggs, and market and transportation problems connected with the egg and poultry trade.

Staff.—G. Arthur Bell, senior animal husbandman in horse investigations; Harry M. Lamon, senior animal husbandman in poultry investigations; W. F. Ward, senior animal husbandman in beef cattle investigations; F. R. Marshall, senior animal husbandman in sheep and goat investigations; W. F. Hammond, animal husbandman in charge of Morgan Horse Farm and first horse-breeding district, Middlebury, Vt.; H. H. Reese, animal husbandman in charge of second horse-breeding district, Front Royal, Va.; R. G. Lawton, in charge of third horse-breeding district, Lexington, Ky.; William P. Little, junior animal husbandman in charge of Colorado horse-breeding station, Fort Collins, Colo.; E. L. Shaw, senior animal husbandman in charge of work of this division at the experiment farm, Beltsville, Md.

Biochemic Division. M. DORSET, *Chief.*

This division prepares tuberculin and mallein for free distribution to health officers for use in official tests; conducts experiments with the object of obtaining vaccines and antitoxins for animal diseases; carries on researches concerning the causes of certain infectious diseases; conducts field demonstrations of methods for controlling hog cholera; takes part in the control of viruses, serums, toxins, and analogous products intended for use in the treatment of domestic animals; carries on experiments with dips and disinfectants; and assists in enforcing the insecticide act of 1910 by examining articles intended for use

in combating insects and fungi which infest domestic animals. In connection with the meat-inspection service, it makes bacteriological and chemical examination of meats and meat-food products and of condiments, etc., used in their preparation.

Scientific staff.—J. A. Emery, assistant chief and member of the Insecticide and Fungicide Board; C. N. McBryde, in charge of bacteriological investigations of meats; R. M. Chapin, in charge of investigations of dips and disinfectants; W. B. Niles, in charge of hog-cholera serum production; U. G. Houck, in charge of cooperative hog-cholera demonstration work; O. B. Hess, in charge of county experiments in eradication of hog cholera; S. E. Bennett, B. W. Murphy, G. S. Weaver, field inspectors in charge of hog-cholera eradication experiments; T. M. Price, in charge of central meat-inspection laboratory; A. H. Roop, C. H. Swanger, W. B. Smith, A. E. Graham, E. A. Boyer, C. N. Marsh, laboratory inspectors in charge of branch meat-inspection laboratories.

Dairy Division. B. H. RAWL, *Chief.*

This division collects and disseminates information concerning dairy farming, the care and improvement of dairy cattle, and the production, care, and distribution of dairy products. It is charged also with the details of administration of the laws concerning the inspection of factories and markets for "renovated" or "process" butter. It carries on research concerning the chemistry and bacteriology of dairy products and in engineering problems that affect various branches of the dairy industry. It also cooperates with State and local institutions in educational work in dairying.

Assistants in charge of sections.—L. A. Rogers, research laboratories; Helmer Rabild, dairy farming investigations; S. C. Thompson, dairy manufacturing investigations; Ernest Kelly, market-milk investigations; J. E. Dorman, western dairy investigations; Robert McAdam, renovated-butter inspection; T. E. Woodward, in charge of the work of the division at the experiment farm, Beltsville, Md.

Field Inspection Division. R. A. RAMSAY, *Chief*; W. P. ELLENBERGER, *Assistant.*

This division, in cooperation with the State authorities, is charged with the work of eradicating scabies in cattle and sheep and the eradication of ticks which infest cattle and transmit disease; also, in cooperation with the Office of Indian Affairs and State authorities, with the eradication of glanders. It has supervision of the interstate transportation of live stock, including inspection, disinfection, certification, etc., also of the details of administering the 28-hour law governing the humane handling of live stock in transit, and the tuberculin testing of cattle and the mallein testing of horses, etc., for interstate movement.

Inspectors in charge of scabies eradication in the field.—H. J. Hammond, Sacramento, Cal.; H. E. Pinkerton, Walla Walla, Wash.; F. E. Murray, Salt Lake City, Utah; Marion Imes, Albuquerque, N. Mex.; W. E. Howe, Denver, Colo.; R. H. Treacy, Bismarck, N. Dak.; James Fleming, Kansas City, Kans.; A. W. Miller, South Omaha, Nebr.

Inspectors in charge of tick eradication in the field.—W. M. MacKellar, San Diego, Cal.; L. J. Allen, Fort Worth, Tex.; F. W. Brewer, Oklahoma, Okla.; A. E. Wight, Little Rock, Ark.; J. A. Kiernan, Birmingham, Ala.; E. M. Nighbert, Atlanta, Ga.; W. K. Lewis, Clemson College, S. C.; T. M. Owen, Norfolk, Va.

Meat Inspection Division. R. P. STEDDOM, *Chief.*

The work of the Meat Inspection Division includes the ante-mortem and post-mortem inspection of cattle, sheep, swine, and goats slaughtered at establishments engaged in interstate or foreign commerce; the supervision of such establishments and of the various processes of preparing, curing, canning, packing, etc., so as to insure sanitary conditions, equipment, and methods; the condemnation and proper disposal of carcasses and products found to be diseased, unwholesome, or otherwise unfit for human food; the marking and certification of meats and products that have been inspected and passed; and the regulation and supervision of the interstate transportation, exportation, and importation of meats and meat food products.

Assistants.—George Ditewig, in charge of western division; A. J. Pistor, in charge of eastern division.

A directory showing the various meat-inspection stations and inspectors in charge may be obtained on application to the bureau.

Pathological Division. JOHN R. MOHLER, *Chief.*

This division conducts scientific investigations of animal diseases; carries on experiments with immunizing agents for the purpose of protecting animals against disease; cooperates with the State agricultural experiment stations with a view to combating diseases peculiar to the localities; determines pathological specimens referred to the division for diagnosis; and prepares and distributes blackleg vaccine.

Scientific staff.—Henry J. Washburn, senior bacteriologist; J. S. Buckley, in charge of field investigations; Adolph Eichhorn, in charge of glanders investigations; B. A. Gallagher, in charge of investigations concerning diseases of poultry and cold-blooded animals; Charles F. Flocken, in charge of cooperative experiments with the Minnesota Experiment Station; Robert J. Formad, assistant in animal pathology; Jacob Traum, assistant in animal bacteriology; John M. Buck, assistant in bacteriology; George M. Potter, in charge of blackleg investigations; H. C. Campbell, in charge of experiments in cooperation with the Pennsylvania Live Stock Sanitary Board; Charles F. Dawson, experiments in cooperation with the Florida State Board of Health; L. Enos Day, in charge of branch pathological laboratory at Chicago, Ill.; George Byron Morse, in charge of branch pathological laboratory at South Omaha, Nebr.

Quarantine Division. RICHARD W. HICKMAN, *Chief.*

The inspection and quarantine of imported animals with a view to excluding contagion, the management of the animal quarantine stations, and the inspection of live stock for export come under this division. The ships carrying exported animals are also inspected, and regulations as to fittings, equipment, ventilation, feed, water, attendants, etc., are enforced. The Quarantine Division administers the sanitary regu-

lations governing the importation of hides, hay, and straw, and directs the tuberculin testing of cattle and the mallein testing of horses for export and import. It also carries on work in cooperation with State and other authorities for the intrastate tuberculin testing of dairy and breeding cattle and the cows supplying milk to cities, with a view to eliminating tuberculosis from such cattle.

Staff.—George W. Pope, assistant chief; B. T. Woodward, in charge of tuberculin testing of dairy cattle.

Zoological Division. B. H. RANSOM, *Chief*.

This division investigates diseases of parasitic origin, collects and describes animal parasites of all kinds, determines such parasites as are sent to the bureau for identification, and keeps a card index of animal parasites and a bibliography of literature relating to them.

Scientific staff.—Albert Hassall, Maurice C. Hall, Howard Crawley, assistant zoologists; W. D. Foster, junior zoologist; Cooper Curtice, assistant in field investigations.

Experiment Station. E. C. SCHROEDER, *Superintendent*; W. E. COTTON, *Assistant*.

The Experiment Station of the bureau is located at Bethesda, Md. It conducts investigations of animal diseases with a view to their control and eradication and their bearing on the public health. A small farm is maintained in such a manner as to provide the other divisions of the bureau with facilities for making observations for which large domestic animals are needed. The work of the station consists of both independent original investigations and investigations in cooperation with and supplemental to those of the other divisions.

Editorial Office. JAMES M. PICKENS, *Editor*.

This office edits manuscripts prepared in the bureau, compiles and prepares information and material for publication and other uses, attends to correspondence relating to the publications and to miscellaneous subjects, makes translations, reads proof, etc.

FOREST SERVICE.

Forester, HENRY S. GRAVES; *Associate Forester*, ALBERT F. POTTER.

The Forest Service administers the national forests, studies forest conditions and methods of forest utilization, investigates the mechanical and physical properties of woods and the processes employed in the manufacture of forest products, and gathers information concerning the needs of the various wood-using industries and the relation of forests to the public welfare generally.

The work of the Forest Service is organized under the Office of the Forester, 5 branches, 7 districts, and 163 national forests.

Office of the Forester.

Office of the Editor. HERBERT A. SMITH, *Editor*; FINDLEY BURNS, *in charge of technical review*; BRISTOW ADAMS, *in charge of information*; DON CARLOS ELLIS, *in charge of educational cooperation*; C. M. BALLARD, *in charge of proofs and forms*.

This office disseminates information concerning forestry through the public press and other channels, and performs the editorial and educational work of the service, including the review and proof reading of publications and forms; cooperation with teachers, officers of public instruction, and others; the preparation, installation, and care of forest exhibits; and the care and use of the lantern-slide collection.

Accounts. M. E. FAGAN, *Chief*; E. A. MELZAR, *Assistant Chief*.

This office is in charge of all fiscal affairs pertaining to the Forest Service—general bookkeeping, controlling accounts, allotments, and liabilities, and all operations of district fiscal agents.

Branch of Operation.

JAMES B. ADAMS, *Assistant Forester in charge*; D. D. BRONSON, *General Inspector*; G. G. ANDERSON, *Administrative Assistant*.

This branch has general supervision of the personnel, quarters, equipment, supplies, and of all permanent improvement work on the national forests.

Geography. C. A. KOLB, *Chief*.

This office collects and preserves maps, compiles general maps and folios for the Forest Atlas, supervises the engraving and printing of maps and diagrams, tabulates forest statistics, collects and records data showing the status of lands within the national forests, and performs photographic work for the service.

Maintenance. GEORGE A. BENTLEY, *Chief*.

The work of this office includes all matters relating to the care of quarters and the purchase and custody of supplies, furniture, instruments, and other equipment in Washington, D. C.

Branch of Lands.

JAMES B. ADAMS, *Assistant Forester in charge*.

This branch has general supervision of all matters relating to the application of the public-land laws to the lands within the national forests, and the uses of national forest lands other than timber sales and grazing.

Land Classification. E. A. SHERMAN, *in charge*; R. V. R. REYNOLDS, *Forest Inspector*.

Examination and classification of lands within the national forests to determine their value for forest purposes.

Settlement.—F. L. HARVEY, in charge. Administration of the Forest Homestead Act of June 11, 1906.

Classification.—H. E. WOOLLEY, in charge. Revision of forest boundaries and general classification of lands within national forests as to their value for forest purposes.

Claims and Occupancy. CHARLES H. SQUIRE, in charge.

The work of this office includes all matters relating to claims on the national forests prior to proceedings before registers and receivers on hearings ordered. The office cooperates with the Office of the Solicitor in procuring necessary evidence to sustain the department's contests; it is also concerned with all questions relating to the occupancy of national forest land for purposes other than timber sales or grazing.

Water Power. O. C. MERRILL, *Chief Engineer*; T. W. NORCROSS, *Assistant Chief Engineer*.

The work of this office includes the handling of all routine connected with the occupancy and use of forest land for hydro-electric power purposes, and of all reports to the Department of the Interior upon rights of way granted by the Secretary of the Interior upon such lands. It also has charge of road-construction work under the provisions of the act of August 10, 1912, appropriating 10 per cent of the annual gross revenue of the national forests for road construction.

Branch of Silviculture.

W. B. GREELEY, *Assistant Forester in charge*; EARLE H. CLAPP and R. Y. STUART, *Forest Inspectors*; AUSTIN CARY, *Logging Engineer*.

Through the district foresters the Branch of Silviculture has supervision of timber sales, timber and fire trespass, and reforestation on the national forests, and of working plans for their better administration. It conducts forest investigations and cooperates with the States and private owners in fire protection and the practice of forestry.

State Cooperation. J. G. PETERS, *Chief*.

This office, in cooperation with the States, investigates forest conditions and suggests needed legislation and forest policies; prepares digests of State forest laws; cooperates with a number of States, under the Weeks law (act of Mar. 1, 1911), in the protection of the watersheds of navigable streams; directs expenditures for this purpose; and inspects the work done in the field.

Forest Investigations. RAPHAEL ZON, *Chief*; S. T. DANA, *Assistant Chief*.

The Office of Forest Investigations deals mainly with the scientific problems underlying the practical management of national and private forests. It directs the work at the national forest experiment stations and investigates the factors controlling the distribution of forests and forest trees, the relation of forests to stream flow and climate, the conditions under which natural regeneration of cut-over, burned-over, or otherwise denuded areas takes place, and the species and methods adapted to use in artificial reforestation under varying site conditions. It also studies the requirements of important species as to climate, soil, moisture, and light. The office furnishes information to owners regarding the care of their woodlands, gives advice as to the best species to plant, and studies the distinguishing characteristics of native and exotic tree species and their woods. The library of the Forest Service is connected with this office; it contains 12,200 books and pamphlets on forestry and allied subjects and 29,641 photographs of trees and forest conditions.

Branch of Grazing.

ALBERT F. POTTER, *Associate Forester, in charge*; LEON F. KNEIPP, *Assistant Forester*; WILL C. BARNES, *Inspector of Grazing*.

The Branch of Grazing has, through the district foresters, general supervision of the range in the national forests. When the number of stock to be allowed on each national forest has been determined by the Secretary of Agriculture, the Branch of Grazing establishes the year-long grazing fee to be charged for each class of stock and authorizes the grazing of sheep and goats upon those portions of the forests which in the judgment of the Forester may properly be opened to them. It also conducts investigations concerning the best use of the forage resources of the national forests.

Grazing Studies. JAMES T. JARDINE, *Inspector of Grazing, in charge*.

This office deals with investigations aimed to bring about more efficient utilization by permitted live stock of the annual forage crop produced on ranges within national forests. It is also directing the survey and type classification of range lands within national forests by range reconnaissance.

Branch of Products.

W. B. GREELEY, *Assistant Forester, in charge*.

Laboratory. HOWARD F. WEISS, *Director*.

A forest-products laboratory is maintained in cooperation with the University of Wisconsin, at Madison. The laboratory conducts the following classes of experimental investigations in the utilization of forest products: (1) The investigation of problems in experimental research; (2) experimental work in cooperation with commercial operations to verify laboratory experiments on a commercial scale; (3) cooperation with individuals or companies to assist them in applying principles and processes of proved commercial value. The lines of work pursued include wood preservation, wood chemistry, timber tests, technology, and maintenance.

Industrial Investigations. O. T. SWAN, *in charge*.

This office studies the wood-using industries of various States, woods used in manufacture, and methods of disposing of mill waste; collects statistics on the price of lumber at the mill and at the principal distributing markets of the country; and studies specifications and grading rules. The office also secures statistics of importance to the experimental work of the service and studies the movements of lumber to and from the principal markets.

Acquisition of Lands under the Weeks Law.

WM. L. HALL, *Assistant Forester in charge*; K. W. WOODWARD, *in charge of administration of acquired lands*; W. W. ASHE, *in charge of examination of lands*; R. W. DIEFFENBACH, *in charge of survey of lands*.

This office designates the areas where lands are to be purchased, receives proposals, examines lands, conducts tentative negotiations, and prepares recommendations to the Secretary of Agriculture and the National Forest Reservation Commission on lands to be acquired under the act of March 1, 1911, for the protection of the watersheds of navigable streams.

Districts.

District 1.—National forests in northern Idaho, Montana, North Dakota, and the northwest corner of South Dakota; headquarters at Missoula, Mont. F. A. Silcox, district forester; E. W. Kramer, district engineer.

District 2.—National forests in Colorado, Kansas, Nebraska, the greater part of South Dakota, eastern and central Wyoming, Minnesota, and Michigan; headquarters at Denver, Colo. Smith Riley, district forester; E. Leonard Lundgren, district engineer.

District 3.—National forests in most of Arizona and all of New Mexico and Oklahoma; headquarters at Albuquerque, N. Mex. A. C. Ringland, district forester; E. Leonard Lundgren, district engineer.

District 4.—National forests in Utah, northwestern Arizona, most of Nevada, southern Idaho, and western Wyoming; headquarters at Ogden, Utah. E. A. Sherman, district forester; J. P. Martin, district engineer.

District 5.—National forests in California and western Nevada; headquarters at San Francisco, Cal. Coert Du Bois, district forester; F. H. Fowler, district engineer.

District 6.—National forests in Washington, Oregon, northwestern California, and Alaska; headquarters at Portland, Oreg. George H. Cecil, district forester; P. H. Dater, district engineer.

District 7.—National forests in Arkansas and Florida; headquarters at Washington, D. C. H. O. Stabler, acting district forester.

Within each district (except district 7) the Offices of Operation, Silviculture, Grazing, Products, and lands perform duties similar to those performed by the corresponding branches outside the districts. The assistant district foresters in charge of these offices in the several districts are as follows:

Operation.—(1) J. F. Preston; (2) Fred W. Morrell; (3) A. O. Waha; (4) A. C. McCain; (5) Roy Headley; (6) C. H. Flory.

Silviculture.—(1) D. T. Mason; (2) C. M. Granger; (3) J. C. Kircher; (4) Ovid M. Butler; (5) T. D. Woodbury; (6) F. E. Ames and C. S. Judd.

Grazing.—(1) C. H. Adams; (2) J. W. Nelson; (3) John Kerr; (4) Homer E. Fenn; (5) John H. Hatton; (6) T. P. McKenzie.

Products.—(5) C. S. Smith; (6) H. B. Oakleaf.

Lands.—(1) R. H. Rutledge; (2) C. J. Stahl; (3) Frank C. W. Pooler; (4) T. C. Hoyt; (5) L. A. Barrett; (6) C. J. Buck.

BUREAU OF PLANT INDUSTRY.

Physiologist and Pathologist and Chief of Bureau, WILLIAM A. TAYLOR; *Horticulturist and Assistant Chief of Bureau*, LEE CLEVELAND CORBETT; *Chief Clerk*, JAMES E. JONES; *Officer in charge of publications*, J. E. ROCKWELL; *Officer in charge of records*, W. P. COX.

The Bureau of Plant Industry studies plant life in all its relations to agriculture. The scientific work of the bureau is divided into 29 distinct groups, over each of which is placed a scientifically trained officer, who reports directly to the chief and assistant chief of the bureau. The work of the bureau is conducted on the project plan, the investigations under each of the offices being arranged by group projects consisting of closely related lines of work, which group projects are further divided into projects.

Laboratory of Plant Pathology. ERWIN F. SMITH, *Pathologist in charge*.

This is the central working laboratory for all of the pathological investigations conducted by the bureau. Studies of the diseases of a wide variety of crop plants are made in the laboratory and supplemented by field investigations and experimentation.

Scientific staff.—R. E. B. McKenney, pathologist; Florence Hedges, Nellie A. Brown, and Lucia McCulloch, assistant pathologists; Mary K. Bryan and Ella M. Enlows, scientific assistants.

Pathological Collections and Inspection Work. FLORA W. PATTERSON, *Mycologist in charge*.

This office maintains economic collections of pathological and related material; identifies edible and poisonous fungi; studies problems in entomogenous fungi; conducts taxonomic work in cooperation with various offices of the bureau; and makes miscellaneous identifications. In addition to securing new species of pathological fungi and systematically inserting them where they may be readily available for study, card indexes are maintained which refer to descriptions of fungi or relate to mycological or pathological

subjects. According to the regulations of the Federal Horticultural Board, systematic inspections are made of all plants received or distributed by the offices of Foreign Seed and Plant Introduction, Crop Physiology and Breeding Investigations, Gardens and Grounds, and Congressional Seed Distribution, in order to prevent the introduction or dissemination of plant diseases.

Scientific staff.—Vera K. Charles, assistant mycologist; Anna E. Jenkins, scientific assistant.

Fruit-Disease Investigations. MERTON B. WAITE, *Pathologist in charge.*

These studies deal with diseases of fruits and fruit trees and methods of controlling or preventing them. They cover deciduous orchard fruits, citrus fruits, small fruits, and the cultivated nuts. Field demonstrations are an important part of the work.

Scientific staff.—C. L. Shear, Charles Brooks, J. G. Grossenbacher, W. S. Ballard, and J. W. Roberts, pathologists; S. M. McMurren, assistant pathologist; Clara H. Hasse, Durward F. Fisher, Angie M. Beckwith, Lee M. Hutchins, and Raymond B. Wilcox, scientific assistants; J. M. Shull, botanical artist; and Leslie Pierce, assistant in spraying demonstrations and experiments.

Investigations in Forest Pathology. HAVEN METCALF, *Pathologist in charge.*

This office studies various diseases affecting forest trees and timber, as well as ornamental and shade trees. The work is conducted in close cooperation with the Forest Service.

Scientific staff.—George G. Hedgcock, pathologist; E. P. Meinecke, J. Franklin Collins, James R. Weir, William H. Long, Rolla Kent Beattie, and Neil E. Stevens, forest pathologists; Carl P. Hartley, C. J. Humphrey, assistant pathologist; Adeline Ames and Theodore C. Merrill, assistant forest pathologists; Ruby J. Tiller, John S. Boyce, Ruth M. Fleming, and Nicholas R. Hunt, scientific assistants; Caroline Rumbold and Frederick D. Heald, experts.

Cotton and Truck Disease and Sugar-Plant Investigations. W. A. ORTON, *Pathologist in charge.*

These investigations cover diseases of garden vegetables, including field demonstration of methods of control and prevention; diseases of cotton and of cowpeas and other forage crops; the culture and utilization of sugar beets, including diseases, improvement in yield and quality of the crop, extension of sugar-beet culture, and the improvement of methods of growing and handling the crop; and the culture and diseases of sugar cane, sugar maple, sorghum, and other sugar-producing plants.

Scientific staff.—H. A. Edson, F. J. Pritchard, and J. B. Norton, physiologists; C. O. Townsend, I. E. Melhus, W. W. Gilbert, H. W. Wollenweber, and L. L. Harter, pathologists; P. A. Yoder, sugar-cane technologist; C. F. Clark, assistant agronomist; W. B. Clark, assistant chemist; H. B. Shaw, assistant pathologist; Venus W. Pool, Clara O. Jamieson, Ethel C. Field, C. W. Carpenter, M. B. McKay, and Lewis E. Longley, scientific assistants; E. C. Rittue, assistant.

Crop Physiology and Breeding Investigations. WALTER T. SWINGLE, *Physiologist in charge.*

This office investigates the physiology of crop plants with a view to determining the limiting factors which control their successful culture and the breeding and testing of new varieties. Several field stations are maintained. Field investigations are conducted on some of the Indian reservations of the Southwest for testing crop plants which seem likely to be suited for culture by the Indians and by white settlers in adjoining regions. Dates, Smyrna figs, hardy citrus fruits, pistaches, and certain drought-resistant tree crops are being tested.

Scientific staff.—S. C. Mason, arboriculturist; G. P. Rixford, physiologist; Maude Kellerman, botanical assistant; E. M. Savage, assistant plant breeder; Bruce Drummond and E. W. Hudson, assistants.

Soil Bacteriology Investigations. KARL F. KELLERMAN, *Physiologist in charge.*

This work is a study of the relation of bacteria to soil fertility, plant growth, cellulose destruction, and the fixation of nitrogen. Pure cultures of nodule-forming bacteria for leguminous crops are distributed.

Scientific staff.—Ira G. McBeth, physiologist; F. M. Scales, assistant soil mycologist; R. C. Wright, F. L. Goll, and Lewis T. Leonard, scientific assistants.

Acclimatization and Adaptation of Crop Plants; Cotton Breeding. O. F. COOK, *Bionomist in charge.*

These investigations have special reference to the acclimatization in the South and Southwest of Central American varieties of cotton, corn, and other tropical crop plants. The breeding of cottons for the boll-weevil territory is a special feature.

Scientific staff.—G. N. Collins and H. Pittier, botanists; J. H. Kinsler, agriculturist; D. A. Saunders, plant breeder; A. T. Anders, assistant in cotton breeding; P. V. Cardon, assistant agronomist; C. B. Doyle and R. M. Meade, scientific assistants; G. B. Gilbert, J. H. Kempton, C. G. Marshall, Guy S. Meloy, and Walton G. Wells, assistants in crop acclimatization.

Drug-Plant, Poisonous-Plant, Physiological, and Fermentation Investigations. RODNEY H. TRUE and W. W. STOCKBERGER, *Physiologists in charge.*

This branch of the bureau studies the commercial culture of drug-producing crops and tea; stock-poisoning plants and methods of preventing the losses caused by them; and plant physiology and fermentation.

Scientific staff.—A. B. Clawson, Heinrich Hasselbring, W. Van Fleet, C. Dwight Marsh, physiologists; H. H. Bartlett, Otis F. Black, H. H. Bunzel, Frank Rabak, and A. F. Sievers, chemical biologists; S. L. Jodidi, organic chemist; W. W. Eggleston, assistant botanist; Lon A. Hawkins, S. C. Hood, James Thompson, and T. B. Young, scientific assistants; G. Archie Russell, expert.

Grain Standardization. J. W. T. DUVEL, *Technologist in charge.*

These investigations relate to the harvesting of grain and its proper preparation for market; its handling, storing, and grading on the farm, at country elevators, and in the terminal markets; and its handling by transportation companies. The purpose is to fix definite standards for the grading of grain, so as to encourage the use of improved methods of handling. This work is conducted at Washington, D. C., and at branch laboratories located at Baltimore, Md.; Chicago, Ill.; Decatur, Ill.; Fargo, N. Dak.; Kansas City, Mo.; and New Orleans, La.

Scientific staff.—E. G. Boerner, G. H. Baston, H. J. Besley, W. P. Carroll, C. L. Cannon, J. H. Cox, L. M. Jeffers, R. C. Miller, E. L. Morris, Philip Rothrock, C. A. Russell, L. M. Thomas, and F. B. Wise, assistants.

Agricultural Technology, Cotton Standardization, Fiber and Paper Plant Investigations.

N. A. COBB, *Technologist in charge.*

These investigations deal with the improvement of technological methods in crop production; the standardization and grading of cotton, measurement of staple, technological ginning investigations, and testing the waste, tensile strength, and bleaching qualities of the different grades of cotton as standardized by the Government; the testing of plants believed to be suitable for paper manufacture; the investigation of fiber plants likely to prove of value in the United States; and the encouragement of fiber-plant industries.

Scientific staff.—L. H. Dewey, botanist in charge of fiber-plant investigations; W. E. Chambers, technologist; Albert Mann, plant morphologist; D. E. Earle and Fred Taylor, cotton technologists; William S. Dean, William R. Meadows, and George E. Carr, assistants in agricultural technology; Emil G. Arzberger, pathologist; Jason L. Merrill, assistant chemist; Frank C. Miles and Robert L. Nixon, scientific assistants; John F. Barghausen, mechanical assistant.

Biophysical Investigations. LYMAN J. BRIGGS, *Biophysicist in charge.*

This office studies physical problems connected with the work of the Bureau of Plant Industry. Attention is chiefly directed at present to biophysical problems in dry-land agriculture, the water requirements and nutrition of crop plants, the influence of the physical environment on crop growth, and investigations in electroculture.

Scientific staff.—J. O. Belz, assistant; J. W. McLane and Julia R. Pearce, laboratory assistants; A. B. Campbell, mechanical assistant.

Seed-Testing Laboratories. EDGAR BROWN, *Botanist in charge.*

These laboratories examine samples of commercial seeds for the presence of adulteration, and conduct a general propaganda in the interest of pure seed for the farmer. The work is performed both in Washington, D. C., and at cooperative laboratories in the field.

Scientific staff.—F. H. Hillman, assistant botanist; W. L. Goss, George T. Harrington, Emma F. Sitrine, Lovina S. Merick, Bertha C. Hite, Anna M. Lute, Norma Waddle, Flora G. Ernst, Helen M. Henry, Cora Jacobs, Etta O. Gilbert, Jessie A. Lee, scientific assistants; Mary L. Stott, Emma S. Doyle, laboratory aids.

Cereal Investigations. MARK ALFRED CARLETON, *Cerealist in charge.*

This work deals with the culture, adaptation, improvement, and uses of cereal crops, the prevention of diseases affecting cereals, and the cultivation and breeding of flax for seed purposes, including a study of flax diseases.

Scientific staff.—Carleton R. Ball, C. E. Chambliss, H. V. Harlan, C. E. Leighty, and C. W. Warburton, agronomists; E. L. Adams, C. H. Clark, F. A. Kiene, jr., assistant agronomists; H. B. Humphrey, pathologist; A. A. Potter, assistant pathologist; John E. Ross and D. E. Stephens, farm superintendents; L. C. Aicher, John H. Parker, J. A. Clark, N. C. Donaldson, J. Michell Jenkins, E. M. Johnston, Jenkin W. Jones, J. D. Morrison, B. E. Rothgeb, T. R. Stanton, Louis Wermelskirchen, and F. R. Babcock, scientific assistants; G. A. McMurdo, assistant; L. R. Breithaupt, L. C. Burnett, W. T. Craig, and A. D. Ellison, agents.

Corn Investigations. C. P. HARTLEY, *Physiologist in charge.*

These investigations cover the principal factors that influence the quantity, quality, and profitability of acre production of corn. They are conducted throughout the United States on farms of members of corn-improvement clubs and other interested farmers.

Scientific staff.—Ernest B. Brown, Curtis H. Kyle, and L. L. Zook, physiologists; J. G. Willier and Fred D. Riehey, scientific assistants.

Tobacco and Plant Nutrition Investigations. W. W. GARNER, *Physiologist in charge.*

The tobacco work has to do with the improvement of tobacco by hybridization and selection, the improvement of methods of growing and handling the crop, the combating of diseases, and the general study of the tobacco-growing industry. Experiments and demonstrations in the growing of tobacco in rotation with farm crops are features of the work.

The plant-nutrition studies relate to some of the broad problems concerned in the growth and development of crop plants as affected by nutrition.

Scientific staff.—E. H. Mathewson and G. W. Harris, crop technologists; Otto Olson, E. G. Beinhart, D. E. Brown, W. M. Lunn, E. G. Moss, R. H. Milton, and James P. Young, assistants in tobacco investigations; J. E. Blohm, special agent; J. S. Cunningham, expert; Charles W. Bacon and H. A. Allard, assistant physiologists; Charles L. Foubert, scientific assistant; Charles S. Ridgway, assistant in botanical laboratory work.

Forage Crop Investigations. CHARLES V. PIPER, *Agrostologist in charge.*

The forage crop investigations include methods of production; development and dissemination of new valuable varieties; extension of forage crops into sections where they are adapted but are grown only to a limited extent; and cooperation in the introduction and extension of new crops.

Scientific staff.—J. M. Westgate and H. N. Vinall, agronomists; Roland McKee, assistant agrostologist; M. W. Evans, W. J. Morse, A. B. Cron, Samuel Garver, R. W. Edwards, Robert E. Getty, and Harvey L. Westover, scientific assistants.

Alkal and Drought Resistant Plant Breeding Investigations. T. H. KEARNEY, *Physiologist in charge.*

This office investigates the alkali resistance of crop plants; develops, by breeding and selection, strains of field crops which will be more resistant to drought than the varieties now obtainable; and studies the physiology of drought resistance. The work is conducted in close cooperation with other branches of the bureau concerned with the upbuilding of agriculture in the West and Southwest.

Scientific staff.—H. L. Shantz and A. C. Dillman, physiologists; R. L. Piemeisel, scientific assistant.

Economic and Systematic Botany. FREDERICK V. COVILLE, *Botanist in charge.*

This office maintains economic collections of cultivated plants and makes systematic studies of grasses and other economic plants, compiles information on native plants for publication, tests wild and little-known plants, and experiments with a view to the improvement of the grazing areas on the national forests.

Scientific staff.—A. S. Hitchcock, systematic agrostologist; W. E. Safford, economic botanist; P. I. Ricker and A. H. Moore, assistant botanists; Agnes Chase and Ivar Tidestrom, scientific assistants; Alice Henkel, assistant.

Farm Management Investigations. W. J. SPILLMAN, *Agriculturist in charge.*

This office studies the details of farm practice. Its main object is to improve farm practice by introducing better business methods and by applying the principles of science wherever they are known. The types of farming prevailing in the various sections of the country are being studied in a number of localities, and a detailed study of farm economics and business principles is being made. Studies of range management and of the use of the cactus as a forage plant are also a part of the work.

Scientific staff.—J. H. Arnold, O. H. Benson, G. A. Billings, D. A. Brodie, Levi Chubbuck, L. A. Clinton, R. W. Clothier, J. S. Cotton, H. R. Cox, M. A. Crosby, L. G. Dodge, J. A. Drake, D. W. Frear, C. L. Goodrich, David Griffiths, Byron Hunter, J. M. Johnson, W. A. Lloyd, J. C. McDowell, A. D. McNair, H. A. Miller, A. G. Smith, C. B. Smith, Harry Thompson, E. H. Thomson, E. O. Wooton, and D. W. Working, agriculturists; O. E. Baker, C. M. Bennett, Maurice C. Burritt, G. W. Bush, L. G. Connor, D. H. Doane, L. W. Fluharty, H. W. Gilbertson, C. M. Hennis, C. E. Hoke, R. C. Hoopingartner, H. B. McClure, H. H. Mowry, C. P. Reed, A. B. Ross, F. D. Stevens, S. M. Tracy, R. E. Willard, assistant agriculturists; E. A. Boeger, H. R. Cates, Jay Coryell, H. M. Dixon, W. C. Funk, Earl S. Haskell, H. N. Humphrey, Oscar Juve, M. B. Oates, F. E. Robertson, A. K. Rothenberger, L. W. Kephart, J. L. Sherman, E. A. Stanford, Earl D. Strait, H. A. Turner, H. F. Williams, A. P. Yerkes, and J. F. Zimmer, scientific assistants; J. S. Ball, Lillian Church, M. O. Cooper, M. R. Cooper, W. R. Humphries, G. H. Miller, H. B. Munger, O. S. Rayner, H. G. Strait, and Raymond S. Washburn, assistants in farm cost accounting; W. A. Etherton, farm architect; Ilena M. Bailey, expert; G. I. Christie, R. J. Evans, K. L. Hatch, E. K. Hibshman, A. N. Hume, Wm. D. Hurd, C. D. Jarvis, E. C. Johnson, Eben Mumford, C. W. Pugsley, A. D. Wilson, Hiram T. French, Thos. P. Cooper, R. B. Coglon, C. F. Curtiss, and B. H. Crocheron, State leaders.

Farmers' Cooperative Demonstration Work. BRADFORD KNAPP, *Special Agent in charge.*

This work is a system of practical instruction for farmers on their own farms by which better farm practices along all lines are illustrated through demonstrations, carried out under the instruction of a corps of State, district, and county agents. The work is mainly in cooperation with States, colleges of agriculture, county organizations, and others. In cotton territory this work specially shows farmers how to raise cotton under boll-weevil conditions, to diversify, etc. Boys' and girls' demonstration work is also conducted on farms.

States.—Texas, Oklahoma, Louisiana, Arkansas, Tennessee, Mississippi, Alabama, Georgia, Florida, South Carolina, North Carolina, Virginia, Maryland, West Virginia, and Kentucky.

Scientific staff.—J. A. Evans, O. B. Martin, agriculturists and general assistants; W. B. Mercier, H. E. Savelle, E. Gentry, I. W. Hill, agriculturists and general field agents; Jesse M. Jones, assistant. W. F. Proctor, W. D. Bentley, C. W. Watson, Mason Snowden, R. S. Wilson, J. Phil Campbell, W. W. Long, C. R. Hudson, T. O. Sandy, H. D. Tate, August Stabler, Dr. Fred Mutchler, C. K. McQuarrie, and N. T. Frame, State agents.

Dry-Land Agriculture Investigations. E. C. CHILCOTT, *Agriculturist in charge.*

This office studies proper cultural methods for the growing of crops in the semiarid regions of the West, especially in that portion known as the Great Plains area. The objects are to determine the best methods of soil preparation and crop rotation for the conservation of moisture and the maintenance of humus in the soil.

Scientific staff.—J. S. Cole, W. W. Burr, traveling field assistants; W. A. Peterson, J. M. Stephens, O. J. Grace, W. D. Griggs, F. L. Kelso, and J. E. Mundell, farm superintendents; C. B. Brown, C. A. Burmeister, E. F. Chilcott, A. L. Hallsted, J. H. Jacobson, L. N. Jensen, J. G. Lill, O. R. Mathews, H. C. McKinstry, G. W. Morgan, A. J. Ogaard, W. M. Osborn, M. Pfaender, J. T. Sarvis, H. G. Smith, R. S. Towle, J. C. Thysell, Leroy D. Willey, Joseph B. Kuska, and Arthur E. Seamans, assistants.

Western Irrigation Agriculture. C. S. SCOFIELD, *Agriculturist in charge.*

This work is concerned with the development of profitable agriculture on the lands to be placed under irrigation in the western United States, and also with the testing of various crops suited for growth under irrigation. The work is conducted in cooperation with a number of the investigational offices of the bureau.

Scientific staff.—F. D. Farrell, agronomist; F. B. Headley, assistant agriculturist; Beyer Aune, R. E. Blair, Dan Hansen, S. H. Hastings, and Fritz Knorr, farm superintendents; Argyle McLachlan, W. E. Townsend, J. A. Holden, C. R. Letteer, C. E. Peterson, Ernest W. Curtis, assistants.

Horticultural and Pomological Investigations. A. V. STUBENRAUCH, *Pomologist and Horticulturist in charge.*

These investigations are concerned with the improvement of methods of growing, handling, shipping, sorting, and marketing perishable fruits and truck and related crops; landscape and vegetable gardening; floriculture; and related subjects. The work is subdivided into fruit-marketing investigations; fruit-transportation and storage investigations; fruit-district investigations; viticultural investigations; nut-culture investigations; pomological breeding investigations, including the improvement of fruits by bud selection; miscellaneous investigations bearing on the development of the fruit industry; truck-crop investigations; landscape-gardening, floriculture, and miscellaneous horticultural investigations; potato investigations; fruit-history investigations; fruit-nomenclature investigations; and fruit-identification investigations.

Scientific staff.—G. B. Brackett, H. P. Gould, George C. Husmann, A. W. McKay, H. J. Ramsey, C. P. Close, and E. R. Lake, pomologists; A. D. Shamel, physiologist; S. J. Dennis, refrigeration technologist; William Stuart, and D. N. Shoemaker, horticulturists; W. F. Wight, botanist; W. W. Tracy, sr., superintendent of testing gardens; F. L. Mulford, landscape gardener; H. C. Thompson, W. V. Shear, and H. M. Conolly, assistant horticulturists; C. W. Mann, C. A. Reed, and C. S. Pomeroy, assistant pomologists; C. G. Patten, expert; Richard Schmidt, assistant in viticultural investigations; William E. Mosher, assistant in refrigeration; George M. Darrow, Charles T. Dearing, George W. Dewey, W. F. Fletcher, K. B. Lewis, Leo B. Scott, D. D. Ward, Margaret Connor, P. M. Lombard, Herbert C. Gore, Edward L. Markell, scientific assistants; F. L. Husmann, viticultural superintendent.

Experimental Gardens and Grounds. E. M. BYRNES, *Assistant in charge.*

This office is charged with the care and ornamentation of the department grounds, the maintenance of greenhouses and plant collections, and the propagation of plants for experimental and other purposes. Experimental work with florists' crops is also being conducted in the greenhouses.

Congressional Seed Distribution.

This work consists of the securing, packeting, and mailing of the quantities of vegetable, flower, and other seeds and plants necessary for congressional distribution, as well as the testing, propagation, and distribution of improved seeds of various crops.

Staff.—R. A. Oakley, agronomist in immediate charge; Oliver F. Jones, executive clerk; J. E. W. Tracy, assistant superintendent of testing gardens.

Foreign Seed and Plant Introduction. DAVID FAIRCHILD, *Agricultural Explorer in charge.*

This office secures promising new seeds and plants, both by agricultural exploration and by correspondence, and these are tested at the plant-introduction gardens or through cooperation with other offices, experiment stations, experimenters, and private individuals. Investigations in plant propagation and in the development of certain plant industries are features of the work.

Scientific staff.—P. H. Dorsett, plant introducer, in charge of plant-introduction field stations; Peter Bisset, plant introducer, in charge of foreign plant distribution; Frank N. Meyer and F. Wilson Popenoe, agricultural explorers; George W. Oliver, plant breeder and propagator; H. C. Skeels and R. A. Young, scientific assistants; Stephen C. Stuntz, botanical assistant; Robert L. Beagles, assistant farm superintendent, in charge of plant-introduction field station, Chico, Cal.; Edward Simmonds, garden and field station superintendent, in charge of subtropical plant introduction field station, Miami, Fla.; H. E. Juene-mann, in charge of bulb-testing garden, Bellingham, Wash.; John M. Rankin, assistant farm superintendent, in charge of Yarrow plant-introduction field station, Rockville, Md.; W. H. F. Gomme, assistant farm superintendent, in charge of plant-introduction field station, Brooksville, Fla.; J. H. Allison, expert.

Arlington Experimental Farm. Directed by Assistant Chief of Bureau.

The Arlington farm is the field laboratory at Washington for the Bureau of Plant Industry, as well as for other bureaus of the department. Widely varying field tests are conducted on the farm.

Staff.—E. C. Butterfield, assistant horticulturist in general charge; J. C. Criswell, assistant superintendent.

BUREAU OF CHEMISTRY.

Chief, CARL L. ALSBERG; *Assistant Chief,* R. L. EMERSON.

The Bureau of Chemistry is concerned primarily with questions of agricultural chemistry of public interest, analytical work and investigations under the food and drugs act, and other chemical investigations referred to it by other branches of the Government service.

Office of General Administration. R. L. EMERSON, *Assistant Chief in charge.*

A. S. Mitchell, administrative assistant; S. H. Ross, administrative assistant; F. B. Linton, supervising clerk; H. F. Fitts, chief clerk; A. E. Draper, librarian; G. O. Savage, editor; J. G. Coleman, H. J. Demaree, and H. Perrone, executive clerks.

State Cooperative Food and Drug Control. J. S. ABBOTT, *Chemist in charge.*

This office endeavors to promote close and cordial cooperation between State and Federal officials charged with the enforcement of all food and drug laws, works out policies for such cooperation, and seeks to unify and harmonize the work and policies of such officials.

Animal Physiological Chemical Laboratory. F. C. WEBER, *Chemist in charge.*

The work in this laboratory includes metabolism and feeding experiments with foods, organic and inorganic compounds, and various carbohydrates; a complete study of infant foods and of the application of chemical methods to the determination of deterioration of animal foods; collaborative work on the production and composition of gelatin and glue; and experimental work to improve the methods of analysis ordinarily employed in physiological chemistry.

Scientific staff.—F. C. Cook, H. W. Houghton, and J. B. Wilson, assistants.

Bacteriological Laboratory. —, *in charge.*

This laboratory makes bacteriological examinations of food materials, both fresh and cold stored, and inspects methods of handling and preparation. The germicidal, antiseptic, and preservative value of certain drugs, chemicals, and fruit juices is tested; bacteria, yeasts, and molds are identified and classified; and surgical dressings, gauzes, ligatures, etc., are examined to determine their sterility.

Scientific staff.—C. Bates, R. C. Greathouse, E. Le Fevre, and M. L. Mason, assistants.

Beverage Laboratory. J. G. RILEY, *Chemist in charge.*

This laboratory conducts field investigations on all potable beverages, including temperance beverages, fermented beverages, and distilled spirits, to obtain proper data for the enforcement of the Food and Drugs Act. Collaborative work for the purpose of improving the methods of analysis of these various products is also an important phase of the work. Check analytical work is also done on interstate and import samples sent in by the branch laboratories.

Scientific staff.—S. Coopersmith, M. J. Ingle, and J. I. Palmore.

Carbohydrate Laboratory. C. S. HUDSON, *Chemist in charge.*

The sugar-inspection laboratory analyzes sugars, sirups, molasses, honeys, jellies, jams, preserves, infant foods, confectionery, and similar substances in connection with the enforcement of the food and drugs act. In cooperation with the contracts laboratory, examinations are made of dextrins, glucose, starches, and other carbohydrate materials used by the Bureau of Engraving and Printing, as well as of all samples of sugars, starches, sirups, and molasses bought by the General Supply Committee. The laboratory investigates the manufacturing processes used in the production of raw and refined sugar and molasses, maple sugar, sirups from cane, maple, and sorghum, and confectionery and jellies. Improved methods of chemical analysis are studied, and also, in collaboration with the International Commission for Uniform Methods of Sugar Analysis, the characteristic constants by which pure carbohydrates are distinguished.

Scientific staff.—C. G. Church, J. K. Dale, T. S. Harding, J. M. Johnson, S. F. Sherwood, M. N. Straughn, and E. Yanovsky, assistants.

Citrus By-Products Laboratory. E. M. CHACE, *Chemist in charge.*

This laboratory directs its attention to devising methods for the utilization of cull oranges and lemons. With this in view, methods are being studied for the manufacture of citric acid, oils of lemon and of orange, concentrated orange juice, and orange vinegar.

Scientific staff.—A. R. Albright, C. P. Wilson, assistants.

Contracts Laboratory. P. H. WALKER, *Chemist in charge.*

The contracts laboratory examines materials which are used by the Department of Agriculture, to determine their purity and compliance with specifications, and does similar work for the other executive departments of the Government. Specifications for supplies are prepared and criticized. Paints and paint materials are studied in cooperation with the Bureau of Standards and the American Society for Testing Materials. Other special investigations deal with enamel-ware cooking utensils, rubber goods, postmark canceling inks, writing inks, typewriter ribbons, glue, soap, lubricating oils, and other supplies used by the Government.

Scientific staff.—C. B. Bacon, E. W. Boughton, J. H. Bower, E. F. Deysher, G. J. Hough, H. C. McNeill, G. C. Schmidt, and F. W. Smither, assistants.

Dairy Laboratory. G. E. PATRICK, *Chemist in charge.*

The dairy laboratory examines dairy products of every description and studies methods for making such examinations. A large part of the work at present is the examination of interstate samples of milk, butter, cheese, condensed milks, dried milks, malted milks, lactated foods, ice cream, and other dairy products to determine questions as to their adulteration and misbranding under the food and drugs act. Samples of imported dairy products are examined, and also samples of dairy products submitted by the General Supply Committee of the Government. Samples from other sources are analyzed when such work promises to be of public benefit.

Scientific staff.—C. H. Biesterfeld, L. W. Ferris, J. T. Keister, and C. C. Scheffler, assistants.

Drug Laboratory. L. F. KEBLER, *Chief.*

This laboratory studies the properties, composition, and quality of drugs and medicinal preparations, and analyzes samples of such products taken in the enforcement of the food and drugs act. It also studies methods which may lead to more satisfactory analytical processes, especially for testing potent plant drugs and products derived from them.

Scientific staff.—V. K. Chesnut, T. C. Merrill, F. P. Morgan, C. E. Parker, H. M. Rhea, B. H. St. John. Drug inspection laboratory: ———, chief; H. E. Buchbinder, C. O. Ewing, E. C. Merrill, A. G. Murray, S. Palkin, assistants. Synthetic products laboratory: W. O. Emery, chief; G. C. Spencer, C. D. Wright, assistants. Essential oils laboratory: E. K. Nelson, chief.

Food Control Laboratory. H. M. LOOMIS, *Chemist in charge.*

The food control laboratory supervises the inspection of food products (not including cattle feeds or dairy products) under the food and drugs act. This work includes the examination of analytical reports on official food samples, the consideration of cases prepared for citation or prosecution, handling of correspondence relating to cases, and to general questions arising under the food and drugs act as they relate to these products. Special studies are also made of the manufacture and production of food products, including work on analytical methods for the examination of these products, particularly in collaboration with the Association of Official Agricultural Chemists.

Scientific staff.—A. W. Broomell, C. O. Dodge, A. M. Doyle, P. B. Dunbar, H. A. Lepper, H. S. Paine, and E. L. P. Treuthardt, assistants.

Food Investigation Laboratory. A. L. WINTON, *Chemist in charge.*

This laboratory conducts investigations that are necessary as a basis for the regulatory work in the food control. At the present moment the following problems are under investigation:

The composition of American oils and fats; the deterioration of corn meal in storage; the composition of commercial generator vinegar and the changes taking place in the conversion of cider into vinegar; the exact determination of the heavy metals in foods; the use of charlock as an adulterant.

Scientific staff.—H. S. Bailey, R. W. Balcom, M. Boyle, L. B. Burnett, W. D. Collins, R. S. Hollingshead, H. E. Patten, and L. A. Wolfe, assistants.

Fruit and Vegetable Utilization Laboratory. H. C. GORE, *Chemist in charge.*

This laboratory is investigating the utilization of culls and surplus fruits and vegetables. At present apples and potatoes are receiving the most attention. Much of this work is in cooperation with the Bureau of Plant Industry. E. G. Grab, assistant.

Leather and Paper Laboratory. F. P. VEITCH, *Chemist in charge.*

This laboratory conducts investigations of tannins and tanning materials, their effects upon the strength and properties of leather, and processes involved in their production; problems relating to the production of leather; the qualities of papers and their fitness for use in the Department of Agriculture and other departments of the Government which may request such investigations; the production of paper; the nature and uses of turpentine and resins, together with improved processes of production; the destructive distillation of wood and methods of improving the quality and quantity of the products. Turpentine and rosin are examined under the food and drugs act. Papers, leathers, turpentine, resins, and textiles are examined for the departments of the Government requesting such work, and specifications are prepared for the purchase of these articles.

Scientific staff.—M. G. Donk, R. W. Frey, H. P. Holman, E. O. Reed, J. S. Rogers, C. F. Sammet, and C. F. Speh, assistants.

Microchemical Laboratory. B. J. HOWARD, *Microscopist in charge.*

This laboratory makes microscopical and microchemical studies of foods, drugs, cattle feed, paper and textile materials, miscellaneous agricultural products, etc. It also makes microscopical examinations of insecticides, and studies methods for their microscopical identification and estimation. Special attention is given to the histological study of fruits, spices, cereals, starches, and other agricultural products for the purpose of perfecting methods for detecting the adulteration of these products.

Scientific staff.—G. L. Keenan, E. A. Read, H. Sherman, B. H. Silberberg, and C. H. Stephenson, assistants.

Miscellaneous Laboratory. J. K. HAYWOOD, *Chief.*

This laboratory studies waters, cattle foods, forage crops, grains, insecticides and fungicides, trade wastes, and certain hygienic problems, makes analyses under the food and drugs act and the insecticide act, and performs such miscellaneous chemical work as may be referred to it. In collaboration with the Bureau of Plant Industry, studies are being made of the changes in composition of grains due to storage and shipping, the composition of range forage plants of the West, and the efficiency of certain insecticides and their effect upon foliage. In collaboration with several experiment stations, studies of more complete methods of analysis of insecticides are being made.

Scientific staff.—Water laboratory: W. W. Skinner, chief; W. F. Baughman, F. B. Furber, C. Huckle, and J. W. Sale, assistants. Cattle-food and grain laboratory: G. L. Bidwell, chief; C. E. Goodrich, J. B. Reed, P. H. Waldruff, and G. P. Walton, assistants. Insecticide and fungicide laboratory: C. C. McDonnell, chief; A. K. Balls, F. L. Elliott, J. T. Graham, E. L. Griffin, O. D. Knight, W. J. Morgan, E. J. Nealon, W. B. O'Brien, W. B. Pope, R. C. Roark, C. M. Smith, C. H. Walker, and H. A. Whitman, assistants. Trade-wastes laboratory: Under chief; W. D. Lynch, assistant.

Nitrogen Laboratory. T. C. TRESKOT, *Chemist in charge.*

Nitrogen determinations for all laboratories of this bureau, as well as for many of the other bureaus of the department, are made in the nitrogen laboratory. Work in cooperation with the Association of Official Agricultural Chemists is also done, looking to the improvement of the methods for making these determinations. H. W. Daudt, assistant.

Organic Investigation Laboratory. I. K. PHELPS, *Chemist in charge.*

This laboratory is conducting investigations in organic chemistry necessary in the enforcement of the food and drugs act. The chief problem engaging it at present is the development of chemical methods for the detection of deterioration and spoilage in foods.

Scientific staff.—L. H. Almy and G. A. Geiger, assistants.

Pharmacognosy Laboratory. A. VIEHÖEVER, *Pharmacognosist in charge.*

This laboratory supervises the inspection of crude drugs under the food and drugs act. It carries out the necessary microscopical and chemical investigations of such drugs. C. D. Mell, assistant.

Pharmacological Laboratory. W. SALANT, *Pharmacologist in charge.*

This laboratory makes researches on the physiological action of poisonous substances occurring in food products and of drugs used as medicine, and physiological tests of drugs to ascertain the strength and purity of medicinal preparations found in the open market.

Scientific staff.—S. Hecht, J. B. Rieger, and C. S. Smith, assistants.

Plant Chemical Laboratory. J. A. LE CLERC, *Chemist in charge.*

The plant chemical laboratory studies the chemistry of plants, with respect especially to climate and environment, both in the greenhouse and in the field; changes taking place in grain during germination, malting, and storage; starch obtained from different sources for technical and food purposes; milling and breadmaking and the drying of potatoes. Work is also done in collaboration with the Bureau of Plant Industry on problems connected with plant-physiological chemistry.

Scientific staff.—L. H. Bailey, J. F. Breazeale, J. Davidson, M. G. Mastin, and H. L. Wessling, assistants.

Field Investigation Service.**Enological Laboratory.** WILLIAM B. ALWOOD, *in charge.*

This laboratory studies (1) alcoholic ferments and the malorganisms associated with them in fruit musts, ciders, wines, and fruit by-products and (2) the composition of fruits and fruit juices, their fermented products, and the residue which is left in the marc or pomace. J. O. Carrero, assistant.

Food Research Laboratory. M. E. PENNINGTON, *in charge.*

The food research laboratory makes chemical, bacteriological, and histological studies of foods preserved by low temperatures. Milk, poultry, and eggs have been the objects of investigation, with reference to their decomposition and putridity during preparation, transportation, storage, and marketing, in connection with the food and drugs act. A special investigation of frozen and dried eggs and egg products has been carried on, chiefly in the egg-breaking establishments, and with the cooperation of the industry.

Scientific staff.—E. D. Clark, E. L. Connolly, A. D. Greenlee, N. Hendrickson, J. S. Hepburn, J. M. Humble, M. Jenkins, H. A. McAleer, H. C. Pierce, and E. Witmer, assistants.

Field Regulatory Service.**Food and Drug Inspection.**

The country has been divided into three food and drug inspection districts, Eastern, Central, and Western, each with a chief in charge, who has immediate supervision of the branch laboratories and the inspectors within his district. The Eastern Inspection District (W. G. Campbell, chief, Washington, D. C.) includes the laboratories in Boston (A. L. Sullivan, chief), Buffalo (W. L. Dubois, chief), New York (R. E. Doolittle, chief), Philadelphia (C. S. Brinton, chief), San Juan (A. E. Taylor, acting chief), Savannah (W. C. Burnet, chief), and Washington (W. J. McGee, chief). The Central Inspection District (L. M. Tolman, chief, Chicago) includes the laboratories in Chicago (G. W. Hoover, chief), Cincinnati (—, chief), New Orleans (F. W. Liepsner, chief), St. Louis (D. B. Bisbee, chief), and St. Paul (E. H. Goodnow, chief). The Western Inspection District (B. R. Hart, chief, San Francisco) includes the laboratories in Denver (R. S. Hiltner, chief), Honolulu (A. W. Hansen, chief), San Francisco (R. W. Hiltz, chief), and Seattle (A. L. Knisely, chief). There is a corps of 43 food and drug inspectors in the field. The taking of samples for analysis constitutes their chief duty, though special investigations in collaboration with the chemists are also made, and factories are inspected in which food and drugs are prepared. Examinations of samples are made for other branches of the Government service as may be necessary.

State Officials authorized to collect samples under the food and drugs act.

Alabama.—R. F. Kolb, Commissioner of Agriculture and Industries, Montgomery. *Arizona.*—Charles A. Meserve,¹ Director of State Laboratory, University of Arizona, Tucson. *Arkansas.*—Morgan Smith, State Health Officer, Little Rock. *California.*—Martin Regensburger, State Board of Health, Berkeley. *Colorado.*—John Lynch, State Board of Health, Denver. *Connecticut.*—H. F. Potter, Dairy and Food Commissioner, Capitol Building, Hartford. *Delaware.*—A. E. Frantz, State Board of Health, Wilmington. *District of Columbia.*—William C. Woodward, Health Department, Washington, D. C. *Georgia.*—J. D. Price, Department of Agriculture, Atlanta. *Idaho.*—James H. Wallis, Department of Food, Drug, and Hotel Inspection, Boise. *Illinois.*—W. Scott Matthews, Food Commission, 1627 Manhattan Building, Chicago. *Indiana.*—H. E. Barnard,¹ State Board of Health, Statehouse, Indianapolis; W. J. Jones, jr.,² Purdue University, Lafayette. *Iowa.*—W. B. Barney, Dairy and Food Commission, Des Moines. *Kansas.*—S. J. Crumrine, State Board of Health, Topeka; L. A. Fitz,² State Agricultural College, Man-

¹ Authorized to collect samples by virtue of appointment as collaborating chemist.

² Authorized to collect samples of feeds and feeding stuffs.

hattan. *Kentucky*.—R. M. Allen, Food and Drug Department, Agricultural Experiment Station, Lexington. *Louisiana*.—Oscar Dowling, State Board of Health, New Orleans. *Maine*.—John A. Roberts, Department of Agriculture, Augusta. *Massachusetts*.—Henry P. Walcott, State Board of Health, Boston, Philip H. Smith,² Agricultural Experiment Station, Amherst. *Michigan*.—James W. Helme, Dairy and Food Department, Lansing. *Minnesota*.—Joel G. Winkler, Dairy and Food Department, St. Paul. *Mississippi*.—W. F. Hand,¹ Agricultural and Mechanical College, Agricultural College. *Missouri*.—F. H. Fricke, Food and Drug Department, La Salle Building, St. Louis. *Montana*.—W. F. Cogswell, Department of Public Health, Helena. *Nebraska*.—Clarence E. Harman, Food, Drug, Dairy, and Oil Commission, Lincoln. *Nevada*.—Sanford C. Dinsmore,¹ Agricultural Experiment Station, Reno. *New Hampshire*.—Irving A. Watson, State Board of Health, Concord. *New Jersey*.—R. B. Fitz-Randolph,¹ State Board of Health, Trenton. *New York*.—Calvin J. Huson, Department of Agriculture, Albany. *North Carolina*.—W. A. Graham, Department of Agriculture, Raleigh. *North Dakota*.—Edwin F. Ladd,¹ Agricultural Experiment Station, Agricultural College. *Ohio*.—S. E. Strode, Dairy and Food Department, Columbus. *Oklahoma*.—Edwin De Barr,¹ State Board of Health, Norman; L. McLennan,² Board of Agriculture, Oklahoma City. *Oregon*.—J. D. Mickle, Dairy and Food Commission, 510 Worcester Building, Portland. *Pennsylvania*.—James Foust, Department of Agriculture, Harrisburg. *Porto Rico*.—W. F. Lippitt, Service of Sanitation, P. O. Box 1108, San Juan. *South Carolina*.—E. J. Watson, Department of Agriculture, Commerce, and Industries, Statehouse, Columbia. *South Dakota*.—Guy G. Frary, Department of Food and Drugs, Vermilion. *Tennessee*.—Lucius P. Brown,¹ Department of Food and Drugs, Nashville. *Texas*.—C. O. Yates, Food and Drug Department, Austin; B. Youngblood,² Agricultural Experiment Station, College Station. *Utah*.—Willard Hansen, Dairy and Food Department, 508 Walker Building, Salt Lake City. *Vermont*.—Charles F. Dalton, State Board of Health, 184 Church Street, Burlington. *Virginia*.—William D. Saunders, Department of Agriculture and Immigration, Richmond. *Washington*.—J. J. Higgins, Department of Agriculture, Olympia. *Wyoming*.—Maurice Groshon, Dairy, Food, and Oil Department, Cheyenne.

BUREAU OF SOILS.

Soil Physicist and Chief of Bureau, MILTON WHITNEY; *Chief Clerk*, A. G. RICE.

The Bureau of Soils investigates the relation of soils to climate and organic life; studies the texture and composition of soils in field and laboratory; maps the soils; studies the cause and means of preventing the rise of alkali in the soils of irrigated districts, and the relations of soils to seepage and drainage conditions.

The bureau prepares annually the report of the Field Operations of the Bureau of Soils, which contains a detailed description of the soils and of the agricultural conditions of the various areas surveyed, points out the present use of the soils, and discusses the possible changes and improvements in crops and methods of cultivation. Large-scale lithographic maps showing the distribution of the different kinds of soils accompany each report.

Laboratories. FRANK K. CAMERON, *Scientist in charge*.

The laboratories investigate the chemical properties of soils in their relation to plant growth; make chemical analysis of soil types and study their requirements with regard to fertilizers; investigate alkali problems; and direct the chemical methods used by field parties. Investigations are in progress regarding the occurrence and extent of natural deposits and of industrial by-products containing fertilizer constituents and the extraction and utilization of these constituents.

The laboratories also investigate the physical properties of soils and their economic bearing; make physical examination and mechanical analysis of soil types for soil-survey parties; prepare and test apparatus used in field work; and investigate from a physical standpoint such mechanical soil problems as arise.

Scientific staff.—J. W. Bombay, H. Bryan, J. A. Cullen, R. O. E. Davis, C. C. Fletcher, Paul J. Fox, W. H. Fry, R. F. Gardiner, Sanders M. Johnson, Benjamin A. Judkins, J. R. Lindemuth, A. R. Merz, C. F. Miller, L. B. Olmstead, W. B. Page, E. G. Parker, W. O. Robinson, W. H. Ross, J. G. Smith, L. A. Steinkoenig, J. W. Turrentine, and W. H. Waggaman.

Soil Survey. CURTIS F. MARBUT, *Scientist in charge*.

The Soil Survey surveys and maps the soils in selected areas in various parts of the United States; correlates the soils of different parts of the country and establishes their scientific classification; and locates, maps, and classifies the soils of agricultural-school farms and experiment-station farms, in cooperation with various State organizations.

Scientific staff.—Southern division, H. H. Bennett, in charge. Northern division, W. E. McLendon and T. D. Rice, in charge. Western division, Macy H. Lapham, in charge. Use of soils, J. A. Bonsteel, in charge; J. E. Lapham, scientist.

J. H. Agee, R. T. Allen, Mark Baldwin, Miles W. Beck, R. T. A. Burke, T. N. Bushnell, W. T. Carter, jr., W. B. Cobb, L. V. Davis, E. B. Deeter, Bruce B. Derrick, J. B. R. Dickey, J. E. Dunn, E. C. Eckmann, W. J. Geib, B. D. Gilbert, A. L. Goodman, E. C. Hall, R. B. Hardison, George L. Harrington, H. W. Hawker, W. H. Helleman, L. C. Holmes, L. A. Hurst, F. Z. Hutton, G. B. Jones, J. A. Kerr, N. M. Kirk, A. E. Kocher, W. J. Latimer, H. G. Lewis, C. Lounsberry, A. W. Mangum, E. T. Maxon, A. H. Meyer, C. N. Mooney, T. M. Morrison, A. L. Patrick, R. F. Rogers, L. A. Schoenmann, E. H. Smies,

¹ Authorized to collect samples by virtue of appointment as collaborating chemist.

² Authorized to collect samples of feeds and feeding stuffs.

H. C. Smith, W. G. Smith, J. M. Snyder, Edmund H. Stevens, A. T. Strahorn, A. T. Sweet, A. E. Taylor, W. E. Tharp, B. W. Tillman, E. S. Vanatta, C. VanDuyne, J. O. Veatch, C. S. Waldrop, E. B. Watson, H. J. Wilder, and R. A. Winston, assistants in the soil survey.

Fertility Investigations. OSWALD SCHREINER, *Scientist in charge.*

The Division of Fertility Investigations studies the causes of and remedy for infertility in certain soils, whether natural or arising from improper methods of cultivation and cropping. It separates, identifies, and studies certain organic substances found in unproductive soils, and corrects their evil effects by mechanical handling, by the use of fertilizers, and by other methods available to the farmer.

Scientific staff.—J. H. Beattie, B. E. Brown, L. J. Gillespie, A. M. Jackson, E. C. Lathrop, F. R. Reid, E. C. Shorey, J. J. Skinner, M. X. Sullivan, E. H. Walters, and H. Winckelmann, assistants.

BUREAU OF ENTOMOLOGY.

Entomologist and Chief, L. O. HOWARD; *Entomologist and Acting Chief in absence of Chief,* C. L. MARLATT; *Executive Assistant,* R. S. CLIFTON.

The Bureau of Entomology studies insects; experiments with the introduction of beneficial insects; makes tests with insecticides and insecticide machinery; and identifies insects sent in by inquirers.

Investigations of Insects Affecting Southern Field Crops. W. D. HUNTER, *in charge.*

These investigations deal with insect pests of cotton, tobacco, sugar cane, and rice, and are planned so as to reveal practical methods of control. Special attention is given to the Mexican cotton-boll weevil and its parasitic enemies.

Cereal and Forage Insect Investigations. F. M. WEBSTER, *in charge.*

The alfalfa weevil, the range caterpillar, the chalcis fly, the alfalfa caterpillar, the alfalfa gall midge, the fall army worm, a new wireworm attacking corn, the corn leaf aphid, the chinch bug, and the Hessian fly are all objects of these investigations. A study of the white grub covers about 20 States. Other insects studied are the southern corn leaf-beetle, false wireworms, the western army cutworm, jointworms, the western corn rootworm, and wireworms. Several entirely new pests to corn, cowpeas, and soy beans are being studied. Fully equipped field stations, manned with trained investigators, are distributed over the country.

Investigations of Insects Affecting Deciduous Fruits. A. L. QUAINANCE, *in charge.*

Insects injurious to orchards, vineyards, nut trees, etc., are studied in this work. Field laboratories are maintained for a series of years in important fruit regions. Demonstrations of the use of insecticides and spraying apparatus are made on a commercial scale. Important projects include investigations of grape insects, the codling moth, cranberry insects, the pear thrips, pecan insects, orchard plant lice, and scale insects.

Investigations of Insects Affecting Tropical and Subtropical Fruits. C. L. MARLATT, *in charge.*

Insects affecting the citrus fruits, olive, fig, and all other tropical and subtropical fruits, as well as the use of hydrocyanic-acid gas and other means of controlling the white fly in Florida and citrus-scale insects in California, are studied in this work.

Truck-Crop and Stored-Product Insect Investigations. F. H. CHITTENDEN, *in charge.*

Field studies of insects affecting vegetable and truck crops are being made in nine States. Projected work includes the control of cutworms and onion, sugar beet, cabbage, cauliflower, asparagus, bean, and pea insects. Studies of hop and mushroom insects are also under way. Among stored products attacked by insects (such as cereals, seeds, dried fruits, nuts, tobacco, meat products, and various fabrics), a special study is being made of export flour from the Gulf region, with similar work for peanuts. New remedies for various pests are being tried.

Forest-Insect Investigations. A. D. HOPKINS, *in charge.*

Field investigations of insects attacking forest trees and forest products, with a view to practical methods of preventing losses, are extended into every State. Demonstration of the value of results already attained is attempted through cooperation with private owners and forest officers.

Investigations of Insects Affecting Shade Trees and Ornamental Trees. Under direction of the Entomologist.

These investigations include the economic treatment of borers, tree defoliators, scales, aphides, and other insects affecting trees in parks and streets, as well as ornamental plants.

Insects Affecting the Health of Man and Animals. Under immediate direction of the Entomologist.

This field covers the relation between certain mosquitoes and malaria and yellow fever, the house fly and typhoid fever, and the stable fly and infantile paralysis, as well as the possible relation between insects and pellagra. The investigation also deals with insects as internal and external parasites of animals and seeks practical methods for their control. A number of pests affecting domestic animals, including the cattle tick, are being studied.

Investigations in Bee Culture. E. F. PHILLIPS, *in charge.*

The structure, development, and behavior of the bee are being investigated. Special attention is given to methods of wintering, with chief emphasis at present on the proper temperature of the bee cellar. Bee diseases are being thoroughly studied. The ultimate object is to furnish helpful information to the bee-keeper.

Gipsy Moth and Brown-Tail Moth Investigations. A. F. BURGESS, *in charge*.

A large field force is maintained in New England in the effort to prevent the spread of these two moths. A laboratory is maintained for the assemblage, study, and liberation of imported parasites of these moths; the work of the parasites is studied in the field.

Miscellaneous Investigations. Under immediate direction of the Entomologist.

Identification of material sent in and classification and care of museum material, the study of household insects, and the importation and exchange of useful species are instances of work coming under this head.

BUREAU OF BIOLOGICAL SURVEY.

Chief, HENRY W. HENSHAW; *Assistant Chief*, T. S. PALMER.

The work of the Bureau of Biological Survey is distributed among three divisions, dealing with the following matters: (1) Study of birds and mammals in their relation to agriculture, their food habits, etc., and recommendation of measures for the preservation of beneficial species and the destruction of harmful species; A. K. Fisher, in charge. (2) Making biological surveys, study of geographic distribution of animals and plants, and mapping natural life zones; E. W. Nelson, in charge. (3) Carrying into effect the Federal laws protecting game, regulating the importation of foreign birds and animals, and protecting migratory birds; T. S. Palmer, in charge.

DIVISION OF ACCOUNTS AND DISBURSEMENTS.

Chief of Division and Disbursing Clerk, A. ZAPPONE.

This division has charge of the disbursement of public funds appropriated for the Department of Agriculture.

Cashier's Section. W. J. NEVIUS, *Cashier and Chief Clerk, in charge*.

This section prepares and mails all checks and handles all moneys received and disbursed.

Bookkeeper's Section. F. W. LEGGE, *Accountant and Bookkeeper, in charge*.

This section keeps the books pertaining to the fiscal affairs of the department, prepares requisitions on the Treasury for advance of public funds, and compiles quarterly abstracts of expenditures and collections and an account current covering the liability for public funds.

Examining Section. EVERETT D. YERBY, *Supervising Auditor, in charge*.

This section examines all accounts before payment.

DIVISION OF PUBLICATIONS.

Editor and Chief, JOS. A. ARNOLD; *Editor and Assistant Chief*, B. D. STALLINGS; *Chief Clerk*, A. I. MUDD.

The Division of Publications conducts all business of the department transacted with the Government Printing Office; has general supervision of all printing, including the editing, indexing, illustration, binding, and distribution of publications, and the maintenance of mailing lists.

Editorial Work. B. D. STALLINGS, *Editor and Assistant Chief, in charge*.

This work includes editing manuscripts and giving directions for printing, correcting proofs, and inspecting completed work.

Editorial corps.—R. B. Handy, Ephraim Cornman, William F. Harding, George W. Kennedy, Stanley Searles, T. K. Burrows, Delos M. Carter, and R. S. Moore, assistant editors.

Indexing. CHARLES H. GREATHOUSE, *Assistant Editor in charge*.

Two kinds of indexes are made: (1) Indexes to be printed with individual publications; (2) a general card index, by subjects, of all publications of the department. Congressional documents are obtained for department officials, and the Congressional Record is marked daily for their attention.

Principal assistants.—Ed. S. Hoskins, Laura B. Lawson, Mary A. E. Smith, and M. M. Moseley.

Illustrations. A. B. BOETTCHER, *Assistant in charge*.

Drawings and photographs are made for use in illustrating publications and also for use in the various branches of the department's work. Photographic prints and lantern slides are sold to the public.

Document Section. FRANCIS J. P. CLEARY, *Assistant in charge*.

This section receives and distributes the publications designed for departmental use; mails circulars and documents not intended for public distribution; furnishes mailing lists and makes orders upon the Public Printer for the mailing of publications intended for the public; specifies the publications to be sent in response to miscellaneous requests; prepares correspondence relating to the publications and keeps all records of the distribution, including the Congressional quotas of Farmers' Bulletins; addresses franks and envelopes, and prepares addresses for mailing lists, of which a general index is kept up to date; and duplicates official circulars, as well as the information prepared for the press.

BUREAU OF STATISTICS.**(Bureau of Agricultural Forecasts.)**

Statistician and Chief of Bureau, LEON M. ESTABROOK; *Assistant Statistician and Acting Chief in absence of Chief*, NAT C. MURRAY; *Assistant Statistician and Assistant Chief of Bureau*, SAMUEL A. JONES; *Chief Clerk*, FRANK G. KELSEY.

The Bureau of Statistics (Bureau of Agricultural Forecasts) issues the monthly crop reports of the department, prepares the statistical portion of the Yearbook of the Department of Agriculture, and makes special investigations relating to agricultural forecasts and estimates for publication or in response to special inquiries.

Crop Reporting Board.

Monthly crop estimates for important crops are made by a Crop Reporting Board, consisting of the chief of bureau, as chairman, and four other members selected from the officials and agents of the bureau. The estimates are based on reports from four independent sources, namely, (1) field agents, (2) State statistical agents, (3) county correspondents, and (4) township correspondents; of the latter there are many thousands. For cotton, reports are received also from (5) ginners, (6) a special list, mostly bankers, supply men, etc., and (7) individual farmers reporting for their own farms.

Division of Forecasts.

The Division of Forecasts receives the reports of the various classes of crop correspondents and tabulates them for the use of the Crop Reporting Board. The reports of correspondents are sent in on blank schedules furnished them by this division, which also keeps the ranks of the correspondents filled up.

Field Service.

The service outside of Washington consists of 22 special field agents, 47 State statistical agents, and about 150,000 voluntary correspondents. The special field agents keep in close touch with the best-informed opinion throughout their districts. The State statistical agents maintain special corps of correspondents.

Division of Estimates.

The Division of Estimates continues the work after harvest that was carried on by the Forecast Division during the crop season. It collates information on agricultural production in form available for farmers and others. The statistical portion of the Yearbook is prepared here. A well-equipped library of agricultural statistics is maintained.

LIBRARY.

Librarian, CLARIBEL R. BARNETT; Assistant Librarian, EMMA B. HAWKS.

The department library contains approximately 130,000 books and pamphlets, including an extensive collection on agriculture and all its branches, a large and representative collection on the sciences related to agriculture, and a good collection of standard reference books. Periodicals currently received number 1,950. A dictionary catalogue is kept on cards, which number about 310,000. The librarian has charge of the foreign mailing lists for department publications.

OFFICE OF EXPERIMENT STATIONS.

Director, A. C. TRUE; Assistant Director, E. W. ALLEN; Chief Clerk, MRS. C. E. JOHNSTON; Librarian, MISS E. L. OGDEN.

In all lines of its work the Office of Experiment Stations cooperates with the State agricultural colleges and experiment stations.

Relations with Institutions for Agricultural Research. *E. W. ALLEN, Assistant Director and Editor of Experiment Station Record.*

Under this head the office is broadly organized to give the State agricultural experiment stations such advice and assistance as will best promote their efficiency. It also collects and disseminates information regarding similar institutions throughout the world. Among its activities in relation to the stations are the following:

Inspection of work and expenditures of the State experiment stations.—The office supervises the expenditures of the Federal funds granted to the State agricultural experiment stations under the acts of Congress of March 2, 1887, and March 16, 1896. This work is assigned especially to the Director, the Assistant Director, W. H. Beal, Walter H. Evans, and J. I. Schulte.

Experiment Station Record.—The office publishes the Experiment Station Record, a periodical which gives abstracts of the bulletins and annual reports of the experiment stations, of the publications of the Department of Agriculture, and of publications reporting investigations in agricultural science in the different countries of the world. The Record contains also editorials and notes bearing upon station work. The staff of the Record is as follows: Assistant editor, H. L. Knight; agricultural chemistry and agrotechny, L. W. Fetzner; meteorology, soils, and fertilizers, W. H. Beal and R. W. Trullinger; agricultural botany, bacteriology, and vegetable pathology, W. H. Evans and W. E. Boyd; field crops, J. I. Schulte and G. M. Tucker; horticulture and forestry, E. J. Glasson; foods and human nutrition, C. F. Langworthy and H. L. Lang; zootechny, dairying, and dairy farming, Hugh Webster; economic zoology and entomology, W. A. Hooker; veterinary medicine, W. A. Hooker and L. W. Fetzner; rural engineering, R. W. Trullinger; rural economics, Eugene Merritt; agricultural education, C. H. Lane; indexer, M. D. Moore.

Editorial Division. *W. H. Beal, Chief.*

With the exception of the Experiment Station Record, this division edits the publications of the Office of Experiment Stations. These include the annual report of the office, reports of investigations made by the several branches of the office, an extensive card index of experiment station literature, and miscellaneous documents.

Division of Insular Experiment Stations. *WALTER H. EVANS, Chief.*

The experiment stations in Alaska, Hawaii, Porto Rico, and Guam are conducted under the general direction of this division.

Alaska Agricultural Experiment Stations. C. C. GEORGESON, *Sitka, Special Agent in charge.*

The main station in Alaska is at Sitka. Investigations are also carried on at Rampart, in the Yukon Valley; at Kodiak; and at Fairbanks, in the valley of the Tanana River. The work consists of field experiments with vegetables, cereals, and forage plants; horticultural investigations; the maintenance of live stock; the curing of hay and silage; the distribution of seeds; and an agricultural survey of the Territory.

Assistants.—J. P. Anderson, Sitka; G. W. Gasser, Rampart; M. D. Snodgrass, Kodiak; J. W. Neal, Fairbanks.

Hawaii Agricultural Experiment Station. E. V. WILCOX, *Honolulu, Special Agent in charge.*

Investigations of the Hawaii Agricultural Experiment Station deal with such crops as cotton, tobacco, rice, forage crops, fiber, and horticultural plants, with plant diseases, and with insects. In cooperation with the Hawaiian Government, demonstration farms have been established on the larger islands.

Staff.—D. T. Fullaway, entomologist; J. E. Higgins, horticulturist; C. J. Hunn and V. S. Holt, assistants in horticulture; W. P. Kelley, chemist; W. T. McGeorge and Alice R. Thompson, assistant chemists; C. A. Sahr, assistant in agronomy.

Porto Rico Agricultural Experiment Station. D. W. MAY, *Mayaguez, Special Agent in charge.*

Investigations of this station relate especially to the growing of coffee, field crops, and horticultural plants, the development of animal industry and dairying, soils, vegetable pathology, and entomology.

Staff.—P. L. Gile, chemist; C. F. Kinman, horticulturist; T. B. McClelland, assistant in horticulture; G. L. Fawcett, plant pathologist, and R. H. Van Zwaluwenburg, entomologist.

Guam Agricultural Experiment Station. A. C. HARTENBOWER, *Guam, Agent in charge;* L. B. BARBER, *Veterinarian and Animal Husbandman;* P. NELSON, *Assistant.*

The station in Guam is located near Agana, the principal town. Experiments are being conducted in improved methods of cultivation, introduction and improvement of tropical agricultural crops, and introduction of improved live stock.

Relations with Agricultural Colleges and Schools. C. H. LANE, *Chief Specialist in Agricultural Education.*

Information regarding the agricultural colleges and schools is collated in this office, which aims to promote the interests of agricultural education, especially the introduction of agricultural instruction into secondary and elementary schools.

Staff.—E. A. Miller, Eugene Merritt, and C. H. Hanson, assistants; D. J. Crosby, collaborator.

Relations with Farmers' Institutes. J. M. STEDMAN, *Farmers' Institute Specialist.*

This branch reports upon the progress of farmers' institutes and aids in making them more effective for the dissemination of the knowledge of agricultural research and improved agricultural practice. It also aids in establishing movable schools and other forms of extension work for adults.

Nutrition Investigations. C. F. LANGWORTHY, *Chief;* R. D. MILNER, *Assistant.*

These investigations deal with the nutritive value of agricultural products used for human food, with special attention to their more effective utilization.

Staff.—S. C. Clark, W. P. Garrety, A. D. Holmes, and H. L. Lang, assistants in nutrition laboratory; Caroline L. Hunt and Helen W. Atwater, expert assistants.

Irrigation Investigations. SAMUEL FORTIER, *Chief.*

The Irrigation Investigations deal with (1) laws and institutions affecting irrigation; (2) the best use of irrigation water; (3) the best methods of bringing water to the place of use and applying it to crops; (4) pumping devices, their efficiency in irrigation, and possibility of their improvement; (5) use and value of various irrigation structures and devices.

Staff.—R. P. Teele, irrigation economist; Fred G. Harden, investigations of canal enterprises; Paul A. Ewing, executive assistant; Frank Huntington, editorial clerk. In charge of field work: A. P. Stover, western Oregon; C. E. Tait, southern California; S. O. Jayne, Washington; Frank Adams, California; W. W. McLaughlin, Utah; P. E. Fuller, Arizona, and power investigations; W. L. Rockwell, Texas; Don H. Bark, Idaho; Milo B. Williams, humid section; C. G. Haskell, rice investigations; R. D. Robertson, central California; V. M. Cone, Colorado; F. L. Bixby, New Mexico; John Gordon, Wyoming; Fred C. Scobey, special investigations of conveyance of water; S. T. Harding, Montana and North Dakota; H. W. Grunsky, Oregon; F. W. Stanley, South Atlantic States; F. L. Peterson, Nevada; and H. C. Diesem, semiarid States. H. E. Murdock, special investigations. Collaborators: W. B. Gregory, pumping plants and canals for rice irrigation; and S. H. Beckett, California. Irrigation farmers: R. G. Hemphill and R. E. Mahoney. Assistant irrigation engineers: Justin T. Kingdon, Reuben B. Sleight, Frank J. Veihmeyer, and James C. Marr.

Drainage Investigations. S. H. McCROXY, *Chief.*

The Drainage Investigations embrace the following subjects: (1) Methods of removing surplus water from lands having agricultural value; (2) protection of lands from periodical overflow of streams; (3) reclamation of tidal lands; and (4) control and conservation of rainfall on hillside lands.

Staff.—Office engineers, R. D. Marsden, A. D. Morehouse, and H. H. Barrows; draftsmen, Will D. Nichols, J. G. Hanford, and Robert G. Green; senior clerk, H. S. Yohe; drainage engineers, H. A. Kipp, S. W. Frescoln, O. G. Baxter, G. M. Warren, D. L. Yarnell, J. V. Phillips, Lewis A. Jones, F. G. Eason, Chas. W. Okey, J. R. Haswell, H. M. Lynde, F. F. Shafer, and A. G. Hall; supervising drainage engi-

neer of irrigated lands, R. A. Hart; drainage engineers for irrigated lands, D. G. Miller, W. W. Weir, Sidney W. Cooper, W. A. Kelly, W. N. Hall, and W. G. Sloan; assistant drainage engineers, C. E. Ramser, Harry G. Hawley, Louie T. Jessup, David E. Heizer, Guy A. Hart, and D. F. Culbertson; engineers available for special work, S. M. Woodward, John T. Stewart, and W. B. Gregory.

OFFICE OF PUBLIC ROADS.

Director, LOGAN WALLER PAGE; *Assistant Director*, P. ST. J. WILSON; *Chief Clerk*, W. CARL WYATT; *Editorial Clerk and Librarian*, WILLIAM W. SNIFFIN.

The Office of Public Roads studies systems of road management and methods of road building, improvement, and maintenance; details engineers to assist local officials in building model roads; ascertains the location, properties, and value of road materials; builds experimental roads to test substitutes for natural road materials; conducts a one-year post-graduate course in highway engineering; investigates the comparative effects of motor and horse traffic on roads; cooperates with colleges and stations and with State highway officials; exhibits models showing types of roads, culverts, bridges, and road machines; and cooperates with the Post Office Department in carrying out the provisions of the Post Office appropriation act of August 24, 1912, relating to the improvement of post roads; and with the Forest Service on road work done with the proceeds of the 10 per cent appropriation from their receipts; and cooperates with the Department of the Interior in the improvement of roads in the national parks.

Road Management Investigations. J. E. PENNYBACKER, *Chief, Division of Road Economics, in charge.*

This work covers general statistical and research investigations; the economic study of highway systems; studies of accounting and cost keeping; compilation and advice upon road legislation; traffic census; lectures, and demonstration of road and bridge models; instruction of students in highway engineering; the maintenance of a State index containing information in concise form with reference to road matters throughout the United States; the employment of a corps of State collaborators, one in each State; and the giving of expert advice in line with the foregoing projects.

Scientific staff.—M. O. Eldridge, assistant in road management; A. S. Brainard, senior highway engineer; George D. Marshall, superintendent of road construction; L. E. Boykin, assistant in road economics; H. W. Hendley, model maker; A. P. Anderson, highway engineer; Thomas E. Stokes, assistant in road economics; James J. Tobin, assistant in road economics.

Road Building and Maintenance Investigations. VERNON M. PEIRCE, *Chief Engineer, in charge of construction*; E. W. JAMES, *Chief, Division of Road Maintenance, in charge of maintenance work*; T. WARREN ALLEN, *Chief, Division of National Park and Forest Roads, in charge of the improvement of roads in National Parks and Forest Reserves*; OSCAR L. GROVER, *Senior Structural Engineer, in charge of bridge work.*

These investigations cover the building of object-lesson and post roads, and object-lesson bridges; the development of county road systems; making inspections and giving expert advice on road and bridge construction; the superintendence of county roads; the making of road surveys; the instruction of students in highway engineering; systems of road maintenance; the maintenance of object-lesson, experimental, and post roads; the construction of roads within the National Parks and Forest Reserves in cooperation with the Department of the Interior and with the Forest Service; the preparation of typical plans for highway bridges and culverts; and experiments with bridge materials.

Scientific staff.—H. L. Arbenz, B. H. Burrell, W. F. Brooks, W. A. Crossland, O. W. Childs, J. D. Fauntleroy, E. O. Hathaway, B. F. Heidel, L. I. Hewes, C. H. Kendall, H. H. Lotter, W. H. Lynch, G. C. Scales, J. F. Schuyler, W. L. Spoon, R. E. Toms, J. T. Voshell, J. A. Whittaker, and J. C. Wonders, senior highway engineers; C. H. Moorefield, C. C. Morris, H. K. Craig, H. S. Fairbank, J. W. Janssen, O. N. Powell, W. H. Rhodes, jr., W. E. Rosengarten, J. R. Shidler, C. R. Thomas, W. J. R. Weir, and M. E. Worrell, highway engineers; E. S. Alderman, R. H. Harrison, H. S. Parry, P. A. Rideout, and L. L. Winans, junior highway engineers; J. H. Dodge, D. G. Haire, C. T. Harrison, H. C. Wells, and D. H. Winslow, superintendents of road construction; T. L. Ainsworth and O. P. Solem, draftsmen; F. A. Davis, Mack Galbreath, A. S. Hathaway, jr., W. R. Overton, J. T. Pauls, R. E. Royall, S. L. Taylor, and W. M. J. Lewis, civil engineer students.

Road Material Investigations. E. B. MCCORMICK, *Mechanical Engineer, in charge of physical laboratory*, and C. S. REEVE, *Chemist, in charge of chemical laboratory.*

These investigations have the routine chemical testing and inspecting of dust preventives and road binders and materials allied to road construction; microscopic examination and classification of road-building rocks; research on properties of dust preventives and road binders; standardization of methods of testing bituminous road materials, experimental bituminous road construction and maintenance; instruction of students in highway engineering; physical testing of road-building materials; concrete road and bridge investigations; nonbituminous road materials investigations; standardization of tests on nonbituminous road materials; and instrument making and repairing.

Scientific staff.—Earl B. Smith, associate mechanical engineer; L. L. Beebe, Morgan Cilley, and Elmer Johnson, assistant mechanical engineers; F. H. Jackson, jr., laboratory assistant; J. P. Nash, laboratory apprentice; E. C. E. Lord, petrographer; F. P. Pritchard, B. A. Anderton, and R. H. Lewis, assistant chemists.

Field Experiments. VERNON M. PEIRCE, *Chief Engineer, in charge of construction*, and E. B. MCCORMICK, *Mechanical Engineer, in charge of traction tests*.

This work comprises the construction of high-class roads in cooperation with some local administrative unit having funds available for the purpose of demonstrating the best methods of constructing the more advanced types of roads and of studying the action of these roads under known conditions of traffic, and investigations concerning various road materials and preparations, investigating and developing equipment intended for the preparation and application of bituminous and other binders; and the conduct of traction tests in order to determine the respective resistances of various road surfaces, and the relative values of wide and narrow tires, of different diameters of wheels, width of tread, together with the effect of grade and method of hitching on the effort that may be exerted by horses; also to determine the effect both on the draft required and on the road surface of increasing the load beyond certain limits.

Scientific staff.—Various members of the force of highway engineers, mechanical engineers, chemists, and civil engineer students in the office.

ADVISORY BOARDS.

Referee Board of Consulting Scientific Experts.

The referee board was created February 24, 1908. It now consists of the following members: Dr. Ira Remsen, president of Johns Hopkins University, chairman; Dr. Russell H. Chittenden, professor of physiological chemistry in Yale University and director of the Sheffield Scientific School; Dr. John H. Long, professor of chemistry in the Northwestern University Medical School; Dr. Alonzo E. Taylor, Benjamin Rush professor of physiological chemistry in the University of Pennsylvania; and Dr. Theobald Smith, professor of comparative pathology in Harvard University. The board considers such questions arising in the enforcement of the food and drugs act of June 30, 1906, as may be referred to it by the Secretary of Agriculture.

Committee on Buildings of the Department of Agriculture.

This committee supervises any necessary changes in department buildings, advises as to proper management of new buildings, rented quarters, etc., and considers bids pertaining to buildings.

Members.—R. M. Reese, Chief Clerk of the department, chairman; Leon M. Estabrook, Chief of Bureau of Statistics; and James E. Jones, Chief Clerk of Bureau of Plant Industry.

Insecticide and Fungicide Board.

The Insecticide and Fungicide Board, created December 22, 1910, assists the Secretary of Agriculture in the enforcement of the insecticide act of 1910.

Members.—J. K. Haywood, chairman; M. B. Waite, A. L. Quaintance, and James A. Emery; executive officer, J. G. Shibley.

Board of Awards.

The Board of Awards opens, examines, and reports upon informal bids and proposals for furnishing supplies and for performing services for the department (except for the Weather Bureau and the Committee on Buildings).

Members.—R. M. Reese, Chief Clerk of the department, chairman; C. C. Carroll, Chief Clerk, Bureau of Animal Industry; F. E. Meloy, Property Clerk, Bureau of Plant Industry.

Federal Horticultural Board.

The Federal Horticultural Board, created August 21, 1912, assists the Secretary of Agriculture in the enforcement of the plant quarantine act of August 20, 1912.

Members.—C. L. Marlatt, chairman; W. A.orton, vice chairman; George B. Sudworth, W. D. Hunter, and A. V. Stubenrauch; R. C. Althouse, secretary of board.

Committee on the Editing of the Journal of Agricultural Research.

The Journal of Agricultural Research publishes technical papers giving the results of the various lines of research carried on by the department. The selection of the papers and the conduct of the Journal are intrusted to this committee.

Members.—Karl F. Kellerman, chairman; Edwin W. Allen, and Charles L. Marlatt.

Committee on Manuscripts.

This committee passes upon manuscripts submitted for publication by the department, making recommendations to the Assistant Secretary of Agriculture.

Members.—William A. Taylor, chairman; Milton Whitney, and Jos. A. Arnold.

Approved:

B. T. GALLOWAY,

Assistant Secretary of Agriculture.

AGRICULTURAL COLLEGES AND EXPERIMENT
STATIONS.

KEY TO ABBREVIATIONS.

<i>Acct.</i> , Accountant, Accounts.	<i>Insp.</i> , Inspector, Inspection.
<i>Actg.</i> , Acting.	<i>Insts.</i> , Institutes.
(<i>Actg.</i>), Acting Professor.	<i>Instr.</i> , Instruction, Instructor.
(<i>Adj.</i>), Adjunct Professor.	<i>Invest.</i> , Investigations, Investigational.
<i>Agr.</i> , Agriculture, Agriculturist, Agricultural.	<i>Irrig.</i> , Irrigation, Irrigationist.
<i>Agron.</i> , Agronomy, Agronomist.	<i>Lab.</i> , Laboratory.
<i>Agt.</i> , Agent.	<i>Landsc.</i> , Landscape.
<i>An.</i> , Animal.	<i>Lect.</i> , Lecturer.
<i>Anal.</i> , Analytical, Analysis.	<i>Libr.</i> , Library, Librarian.
<i>Anat.</i> , Anatomy.	<i>Mach.</i> , Machine, Machinery.
<i>Arch.</i> , Architecture.	<i>Mech.</i> , Mechanics, Mechanical.
<i>Assoc.</i> , Associate.	<i>Met.</i> , Meteorology, Meteorologist.
(<i>Assoc.</i>), Associate Professor.	<i>Mfrs.</i> , Manufactures.
<i>Asst.</i> , Assistant.	<i>Mgr.</i> , Manager.
(<i>Asst.</i>), Assistant Professor.	<i>Mgt.</i> , Management.
<i>Bact.</i> , Bacteriology, Bacteriologist.	<i>Mycol.</i> , Mycology, Mycologist.
<i>Biol.</i> , Biology, Biologist, Biological.	<i>Nat.</i> , Natural.
<i>Bot.</i> , Botany, Botanist, Botanical.	<i>Nutr.</i> , Nutrition.
<i>Br.</i> , Branch.	<i>Oler.</i> , Olericulture, Olericulturist.
<i>Brdg.</i> , Breeding.	<i>Org.</i> , Organic.
<i>Chair.</i> , Chairman.	<i>Ornith.</i> , Ornithologist, Ornithology.
<i>Chem.</i> , Chemist, Chemistry, Chemical.	<i>Parasitol.</i> , Parasitologist, Parasitology.
<i>Climat.</i> , Climatology, Climatologist.	<i>Path.</i> , Pathology, Pathologist.
<i>Coll.</i> , College.	<i>Pedag.</i> , Pedagogy, Pedagogics.
<i>Comp.</i> , Comparative.	<i>Pharm.</i> , Pharmacist, Pharmaceutical, Pharmacologist.
<i>Comr.</i> , Commissioner.	<i>Photog.</i> , Photography.
<i>Consult.</i> , Consulting.	<i>Phys.</i> , Physics, Physicist, Physical.
<i>Coop.</i> , Cooperative, Cooperation, Cooperator.	<i>Physiol.</i> , Physiology, Physiologist, Physiological.
<i>Corresp.</i> , Correspondence, Correspondent.	<i>Polit.</i> , Political.
<i>Dem.</i> , Demonstration, Demonstrator.	<i>Pomol.</i> , Pomology, Pomologist.
<i>Dept.</i> , Department.	<i>Pract.</i> , Practice, Practical, Practicums.
<i>Dir.</i> , Director.	<i>Prep.</i> , Preparatory.
<i>Distrib.</i> , Distribution.	<i>Pres.</i> , President.
<i>Div.</i> , Division.	<i>Prin.</i> , Principal.
<i>Dom.</i> , Domestic.	<i>Prod.</i> , Production.
<i>Econ.</i> , Economy, Economic, Economics.	<i>Sch.</i> , School.
<i>Ed.</i> , Education.	<i>Sci.</i> , Science, Scientific.
<i>Ele.</i> , Elementary.	<i>Sec.</i> , Secretary.
<i>Engin.</i> , Engineer, Engineering.	<i>Secon.</i> , Secondary.
<i>Ent.</i> , Entomology, Entomologist.	<i>Sew.</i> , Sewing.
<i>Expt.</i> , Experiment, Experimental, Experimenter.	<i>Sociol.</i> , Sociology.
<i>Ext.</i> , Extension.	<i>Sta.</i> , Station.
(<i>Ext. Asst.</i>), Extension Assistant Professor.	<i>Substa.</i> , Substation.
(<i>Ext. Assoc.</i>), Extension Associate Professor.	<i>Supl.</i> , Superintendent.
<i>Feed.</i> , Feeding.	<i>Sur.</i> , Surgery.
<i>Fert.</i> , Fertility, Fertilizer.	<i>Tech.</i> , Technology, Technical, Technologist.
<i>Flor.</i> , Floriculture, Floriculturist.	<i>Treas.</i> , Treasurer.
<i>For.</i> , Forestry.	<i>Trop.</i> , Tropical.
<i>Gard.</i> , Gardening.	<i>Univ.</i> , University.
<i>Gen.</i> , General.	<i>V. Dir.</i> , Vice Director.
<i>Geol.</i> , Geology, Geologist, Geological.	<i>Veg.</i> , Vegetable, Vegetation.
<i>Grad.</i> , Graduate.	<i>Vet.</i> , Veterinary, Veterinarian.
<i>Hist.</i> , History.	<i>Vit.</i> , Viticulture, Viticulturist.
<i>Hort.</i> , Horticulture, Horticulturist.	<i>V. Pres.</i> , Vice President.
<i>Husb.</i> , Husbandry, Husbandman.	<i>Voc.</i> , Vocational.
<i>Hyg.</i> , Hygiene.	<i>Zool.</i> , Zoology, Zoologist.
<i>Indus.</i> , Industrial, Industry, Industries.	
<i>Inorg.</i> , Inorganic.	

AGRICULTURAL COLLEGES AND EXPERIMENT STATIONS.¹

(Prepared in the Office of Experiment Stations,
A. C. TRUE, *Director*.)

ALABAMA.

Alabama Polytechnic Institute and the Agricultural Experiment Station, Auburn.

*College faculty. †Station staff.

*C. C. Thach, A. M., LL. D., *President*.

*†J. F. Duggar, M. S., *Dir. Sta. Agr.*(*)†

*†Samuel Adler, M. S., *Asst. Chem.*

†J. T. Anderson, Ph. D., *Chem., Soil and Crop Invest.*

*P. F. Bahnsen, V. S., *Lect. Phys. Diagnosis.*

*†Thomas Bragg, M. S., (*Asst.*) *Chem.; Asst. Chem.*

*†J. E. Buck, M. S., *Instr. Ent.; Asst. Ent.*

*†J. S. Caldwell, A. M., *Bot.; Plant Physiol.*

*†C. A. Cary, B. S., D. V. M., *Dean Vet. Med. and Surg., Physiol.; Vet. Dir. Farmers' Insts. (State Vet.).*

†E. F. Cauthen, B. S., *Assoc. Agr., Recorder.*

*†L. N. Duncan, M. S., *Agr. Sch. Ext. Work; Supt. Ext. Work (Coop. U. S. D. A.).*

*C. W. Ferguson, D. V. M., M. D. C., *Instr. Vet. Med.*

*†M. J. Finess, M. S., (*Asst.*) *Agr.; Asst. Agr.*

*†E. S. Girton, B. S., (*Asst.*) *An. Indus.; Asst. An. Indus.*

*†A. R. Gissendanner, B. S., *Asst. An. Indus.*

*H. M. Hamilton, D. V. M., *Instr. Vet. Med.*

*†C. L. Hare, M. S., *Phys., Physiol. Chem.; Chem.*

†L. J. Hawley, B. S., *Agr. Field Agt.*

*†W. E. Hinds, Ph. D., *Ent.*

*†J. B. Hobdy, M. S., *Agr. Sch. Ext. Work; Asst. in Agr. Ext. Work (Coop. U. S. D. A.).*

†J. B. Jackson, B. S., *Analyst.*

†S. S. Jordan, B. S., *Asst. Beef Husb. (Coop. U. S. D. A.).*

*†I. S. McAdory, B. S., D. V. M., (*Asst.*) *Vet. Sci. Asst. Vet.*

†J. A. McLeod, B. S., (*Columbia*), *Asst. An. Husb.*

*†A. B. Massey, B. S., (*Asst.*) *Bot.; Asst. Bot.*

*P. P. Powell, M. S., (*Asst.*) *Chem.*

*†J. C. C. Price, B. S., *Instr. Hort.; Asst. Hort.*

†Mrs. Birdie I. Robertson, *Asst. Girls' Dem. Work (Coop. U. S. D. A.).*

*†B. B. Ross, M. S., *Dean Agr. Sci.; Agr. Chem.; State Chem.*

*J. R. Rutland, A. B., *Libr.*

*L. A. Scarbrough, B. S., *Asst. Chem.*

†O. H. Sellers, B. S., *Asst. Agr., Sec. to Dir.*

*†J. P. C. Southall, M. A., *Phys.*

†G. V. Stelzenmuller, B. S., *Asst. Field Hort.*

*†G. S. Templeton, B. S., *An. Indus.*

*A. L. Thomas, M. E., *Instr. Phys.*

*†H. B. Tisdale, B. S., *Asst. Agr., Coll. Recorder.*

*†Ernest Walker, B. S., *Hort.*

*W. W. Webb, D. V. M., *Instr. Physiol., Therapeutics.*

*G. R. White, M. D., D. V. S., *Lect. An. Restraint, Surg.*

†J. T. Williamson, B. S., *Agr. Field Agt.*

*†F. A. Wolf, Ph. D., *Plant Path.*

Canebrake Agricultural Experiment Station, Uniontown.

†L. H. Moore, *Dir., Sec.*

Agricultural and Mechanical College for Negroes, Normal.

*College faculty.

*W. S. Buchanan, B. A. S., A. M., *President. Agr.*

*G. C. Buchanan, *An. Indus.*

*Elizabeth B. Cooke, *Millinery, Fancy Sew.*

*Sara E. Grisby, R. N., *Nursing.*

*Willie M. Maddux, *Plain Sew.*

*Louise M. Mason, *Laundering.*

*C. Olga Mitchell, *Dressmaking.*

*P. C. Parks, B. S. A., *Farm Mgt.*

*Mary W. Stewart, *Cooking.*

*Mrs. Alice M. Watkins, *Supervisor Female Indus.*

¹ These lists were compiled by Mary A. Agnew and Althea E. Thacker, of the Office of Experiment Stations, and are intended to replace the "Organization Lists of the Agricultural Colleges and Experiment Stations in the United States" heretofore issued by that office. They differ from the latter in that they include only names of persons directly engaged in teaching or investigation in agriculture and home economics.

The names are arranged alphabetically for each institution. This arrangement, with the name index at the end of the bulletin, it is thought, will facilitate the finding of names, especially in the longer lists. An asterisk (*) indicates a college officer and a dagger (†) a station officer. When the title of the position in the station differs from that in the college the latter is given first, except in the case of the director of the station. A key to the abbreviations used is given on page 26.

Agricultural School and Agricultural Experiment Station of the Tuskegee Normal and Industrial Institute, Tuskegee Institute.

*College faculty. †Station staff.

*B. T. Washington, *Principal.*

*†G. W. Carver, M. S., *Dir. Sta. Dept. of Research, Consult. Chem. (*†)*

*M. F. Ballentine, *Horse Husb.*
 *†J. H. Bias, D. V. S., *Vet.*
 *†G. R. Bridgeforth, B. S., *Dir. Agr. Indus.*
 †M. W. Brooks, *Truck Gard.*
 *Marion Brown, *Ladies' Tailoring.*
 *C. J. Calloway, *Dir. Ext. Div.*
 †T. M. Campbell, *Dem. and Farmers' Inst. Work.*
 *†A. G. Chandler, *Asst. to Farm Supt.*
 *†T. N. Cowen, *Farm Supt.*
 *Mary E. Davis, *Housekeeping.*
 *Minnie E. Davis, *Housekeeping.*
 *Josephine I. Doggett, *Asst. Laundering.*
 *Ophelia M. Donaldson, *Asst. Laundering.*
 *†J. R. Fugett, *Dairying.*
 *Mollie L. Golden, *Housekeeping.*
 *C. A. Graine, *Laundering.*
 *†C. W. Greene, *Farm Crops, Poultry.*
 *Carolyn G. Howard, *Asst. Dom. Sci.*

*Hattie E. King, *Dressmaking.*
 *†Augustus McGriff, *Fruit Growing.*
 *Annie D. Oakes, *Plain Sew.*
 *†R. S. Pompey, *Dairy Husb.*
 *†O. D. Pyles, *Asst. Agr. Instr.; Agr. Chem.*
 *†N. D. Ricks, *Asst. Agr. Instr.; Asst. Farm Supt.*
 *†R. R. Robinson, *Swine Husb.*
 *Susan M. Russell, *Dom. Sci.*
 †W. A. Tate, *U. S. Dem. Work.*
 *Cornelia A. Vivian, *Millinery.*
 *Mrs. B. T. Washington, *Dir. Women's Indus.*
 *†L. J. Watkins, *Road Bldg., Survey, Construction Work.*
 *Luvonia Williams, *Housekeeping.*
 *D. A. Williston, B. S. A., *Landscape Gard.*
 *C. W. Wood, *Libr.*
 *†Matthew Woods, *Asst. to Dirs.*

ALASKA.

Agricultural Experiment Stations, Sitka, Kodiak, Rampart, and Fairbanks.

Under the supervision of A. C. True, Director Office of Experiment Stations, U. S. Department of Agriculture.

†Station staff.

†C. C. Georgeson, M. S., *Special Agt., Sitka.*

†J. P. Anderson, *Hort., Sitka.*
 †G. W. Gasser, B. S., *Asst., Rampart.*
 †C. W. Heideman, jr., *Herdsmen, Kodiak.*

†Laurence Kelly, *Asst. Dairyman, Kodiak.*
 †J. W. Neal, *Asst., Fairbanks.*
 †M. D. Snodgrass, B. S., *Asst., Kodiak.*

ARIZONA.

University of Arizona and the Agricultural Experiment Station, Tucson.

*College faculty. †Station staff.

*A. H. Wilde, Ph. D., *President.*

*†R. H. Forbes, M. S., *Dir. Sta. Dir. Agr. Instr. (*†)*

*P. M. Brinton, M. S., (*Assoc.*) *Chem.*
 *J. G. Brown, *Instr. Biol.*
 †C. N. Catlin, A. M., *Asst. Chem.*
 *†R. W. Clothier, M. S., *Agr.*
 *A. E. Douglass, Sc. D., *Phys.*
 †A. L. Enger, B. S., *Asst. Engin.*
 †G. F. Freeman, B. S., *Plant Brdg.*
 †C. E. Grassick, *Sec.*
 *F. N. Guild, M. S., *Chem.*
 †R. E. Heagy, *Libr.*
 *†W. H. Lawrence, M. S., *Hort.*

†A. M. McOmie, B. S., (*Phoenix*), *Supt. Substa., Asst. Agr. Supt. Farmers' Insts. and Ext. Work.*
 *C. A. Meserve, Ph. D., *Bact.*
 †A. W. Morrill, Ph. D., (*Phoenix*), *Ent. (State Ent.).*
 *†S. F. Morse, B. A. S., *Agr. (Actg.).*
 †G. E. P. Smith, C. E., *Irrig. Engin.*
 *DeRossette Thomas, B. S., *Instr. Home Econ.*
 *†J. J. Thorner, M. A., *Biol.; Bot.*
 *†J. C. Th. Uphof, *Instr. Plant. Brdg.; Asst. Plant Breeder.*
 *†A. E. Vinson, Ph. D., *Agr. Chem.; Biochem.*
 *†F. W. Wilson, M. S., *An. Husb.*

ARKANSAS.

College of Agriculture and the Agricultural Experiment Station of the University of Arkansas, Fayetteville.

*College faculty. †Station staff.

*J. C. Futrall, A. M., *Actg. President University.*

*†Martin Nelson, M. S., *Dean Coll. Agr. Dir. Sta. Supt. Farmers' Insts. Agron. (*†)*

*Mrs. Mary Austin, *Libr.*
 *†G. G. Becker, B. S. A., (*Actg.*) *Ent.; Actg. Ent.*
 *J. M. Borders, B. S. A., *Asst. Ext. Work.*

*†D. H. Branson, B. S., *Asst. Animal Husb.*
 *C. G. Carroll, Ph. D., *Chem.*
 *†R. R. Dinwiddie, V. S., M. D., *Path., Bact.*

¹ On leave.

- *W. S. Fields, B. S. A., *Instr. Plant Path.; Asst. Plant Path.*
 *W. L. Fowler, B. S. A., *An. and Dairy Husb.*
 *R. M. Gow, D. V. M., *Vet. Sci.; Vet.*
 *J. L. Hewitt, B. S. A., *Plant Path.*
 †R. L. Hood, *Libr.*
 *W. C. Lassetter, B. S., (*Asst.*) *Agron.; Asst. Agron.*
 *K. M. McArthur, M. S., *Instr. Path., Bact.; Asst. Path., Bact.*

- *H. E. Morrow, B. S. A., (*Assoc.*) *Chem.*
 *W. L. Nettleship, *Asst. Dairying.*
 *L. W. Osborn, B. S. A., *Instr. Agron.; Asst. Agron.*
 *C. V. Ruzek, B. S. (*Asst.*) *Agron.; Asst. Agron.*
 *R. C. Thompson, B. S., *Agr. Chem.*
 *H. E. Truax, B. S., *Instr. Hort.; Asst. Hort.*
 *J. R. Tucker, B. S., *Instr. Agr. Chem.; Asst. Chem.*
 *W. R. Wheelock, B. S. A., *Supt. Ext. Work.*
 *W. H. Wicks, M. S., *Hort.*

CALIFORNIA.

College of Agriculture and the Agricultural Experiment Station of the University of California, Berkeley.

*College faculty. †Station staff.

*B. I. Wheeler, Ph. D., LL. D., *President of University.*

*T. F. Hunt, D. Agr., D. Sc., *Dean College of Agr. Dir. Sta. Agr. (*†)*

- *R. L. Adams, M. S., (*Asst.*) *Agron.; Asst. Agron.*
 *J. A. Armstrong, B. S., *Asst. in Agr. Ext.*
 *W. H. Arnold, B. S., (*Davis*), *Instr. Chem., Bot.*
 *E. B. Babcock, M. S., *Genetics.*
 †H. S. Baird, B. S., (*Davis*), *Asst. Dairy Indus.*
 †G. Barovetto, (*Davis*), *Asst. Vit.*
 *J. T. Barrett, Ph. D., (*Riverside*), *Plant Path.*
 *H. P. Barrows, B. S., *Instr. Agr. Ed.*
 †S. H. Beckett, B. S., (*Davis*), *Asst. Irrig. (Coop. U. S. D. A.).*
 †H. E. Billings, M. S., *Asst. Chem.*
 *F. T. Bioletti, M. S., *Vit., Enology.*
 *L. O. Bonnet, I. A., *Instr. Vit.; Asst. Vit.*
 *W. W. Bonns, M. S., (*Riverside*), (*Asst.*) *Pomol.; Asst. Pomol.*
 *V. C. Bryant, M. S., *Asst. Agr. Ext.*
 †Mrs. D. L. Bunnell, *Libr.*
 *J. S. Burd, B. S., *Agr. Chem., (Fert. Control).*
 *P. S. Burgess, M. S., *Instr. Soil Bact.; Asst. Soil Bact.*
 *A. H. Christiansen, B. S., *Asst. Agr. Ext.*
 *Lillian D. Clark, *Asst. Agr. Ext.*
 *W. T. Clarke, B. S., *Agr. Ext., Supt. Farmers' Insts.*
 *J. E. Coit, Ph. D., *Citriculture.*
 *G. E. Colby, M. S., (*Asst.*) *Agr. Chem.; Asst. Chem.*
 *G. A. Coleman, *Instr. Ent.; Asst. Ent.*
 *I. J. Condit, B. S., *Instr. Citriculture; Asst. Citriculturist.*
 *B. H. Crocheron, M. S. A., (*Asst.*) *Agr. Ext. State Leader (Coop. U. S. D. A.).*
 *W. V. Cruess, B. S., (*Asst.*) *Zymology; Asst. Zymologist.*
 *L. M. Davis, B. S., (*Davis*), (*Asst.*) *Dairy Indus.; Asst. Dairy Indus.*
 †J. D. Denny, (*Davis*), *Asst. Agron.*
 †W. H. Dore, B. S., *Asst. Agr. Chem.*
 *J. E. Dougherty, B. S., (*Davis*), (*Asst.*) *Poultry Husb.; Asst. Poultry Husb.*
 *H. H. Douglass, M. S., (*Davis*), *Asst. Dairy Husb.*
 *B. A. Etcheverry, B. S., *Irrig.*
 *H. S. Fawcett, M. S., (*Riverside*), (*Assoc.*) *Plant Path.; Assoc. Plant Path.*
 *F. C. H. Flossfeder, (*Davis*), *Instr. Vit.; Asst. Vit.*
 †H. B. Frost, Ph. D., (*Riverside*), *Asst., Citrus Expt. Sta.*

- *W. F. Gericke, B. S., *Instr. Soil Chem.; Asst. Soil Chem.*
 *J. W. Gilmore, M. S. A., *Agron.*
 *G. P. Gray, M. S., *Instr. Insecticides; Asst. Chem. Insecticide Control.*
 *J. W. Gregg, B. S., *Landsc. Gard., Flor.*
 †J. E. Guernsey, M. S., *Asst. Soil Tech.*
 *E. H. Hagemann, (*Davis*), *Instr. Dairying; Asst. Dairy Indus.*
 *H. M. Hall, Ph. D., (*Asst.*) *Bot.; Asst. Bot.*
 *C. M. Haring, D. V. M., *Vet. Sci.; Vet., Bact.*
 *F. M. Hayes, D. V. M., (*Asst.*) *Vet. Sci.; Asst. Vet.*
 †A. H. Hendrickson, B. S., *Asst. Pomol.*
 †G. W. Hendry, B. S., *Asst. Agron.*
 †W. B. Hermes, M. A., (*Asst.*) *Parasitol.; Asst. Ent.*
 †P. L. Hibbard, B. S., *Asst. Agr. Chem.*
 *E. W. Hilgard, Ph. D., LL. D., *Agr. Chem. Emeritus.*
 †Miss C. J. Hill, *Asst. Dairy Testing.*
 †F. E. Hill, (*Santa Monica*), *For.*
 *D. R. Hoagland, M. S., (*Asst.*) *Agr. Chem.; Asst. Agr. Chem.*
 *W. T. Horne, B. S., (*Asst.*) *Plant Path.; Asst. Plant Path.*
 *W. G. Hummel, M. S., (*Asst.*) *Agr. Ed.*
 *T. Fr. Hunt, B. S., *Asst. Agr. Ext.*
 †O. W. Israelsen, B. S., (*Davis*), *Asst. Irrig.*
 *Mrs. Adele S. Jaffa, M. S., *Lect. Dietetics.*
 *M. E. Jaffa, M. D., *Nutr.*
 *Katherine D. Jones, B. S., *Asst. Landsc. Gard.*
 *P. B. Kennedy, Ph. D., (*Asst.*) *Agron.; Asst. Agron.*
 *O. J. Kern, (*Asst.*) *Agr. Ed.*
 *James Koeber, (*Davis*), *Instr. Farm Mech.*
 *E. J. Lea, M. S., (*Asst.*) *Nutr.; Asst. Nutr.*
 *C. B. Lipman, Ph. D., *Soil Chem., Bact.*
 †W. E. Lloyd, B. S., (*Davis*), *Asst. Poultry Husb.*
 *R. H. Loughridge, Ph. D., *Agr. Chem., Soil Chem. Emeritus.*
 †Anna M. Lute, A. B., *Seed Tester (U. S. D. A. Service).*
 *C. H. McCharles, M. S., (*Asst.*) *Nutr.; Asst. Nutr.*
 *B. A. Madson, B. S. A., (*Davis*), (*Asst.*) *Agron.; Asst. Agron.*
 *L. K. Marshall, (*Fresno*), *Asst. Agron.*
 †W. C. Matthews, A. B., *Artist.*

¹ On leave.

- *†Margaret Mayberry, (Davis), *Libr. Univ. Farm.*
 †W. M. Mertz, (Riverside), *Asst. Pomol.*
 †M. R. Miller, B. S., *Asst. Chem., Insecticide Control.*
 *C. S. Milliken, B. S., (Riverside), *Asst. Supt. Agr. Ent.*
 *†J. F. Mitchell, D. V. M., *Instr. Vet. Sci.; Asst. Vet.*
 †J. N. Moore, (Chico), *For.*
 *†D. N. Morgan, B. S., *Sec. Coll.; Asst. to Dir.*
 *†J. W. Nelson, B. S., (Asst.) *Soil Tech.; Asst. Soil Tech.*
 †L. J. Nickels, B. S., (Davis), *Asst. Ent.*
 †W. F. Oglesby, A. B., *Asst. Vit.*
 †W. E. Packard, M. S., (El Centro), *Asst. Agron.*
In charge Imperial Valley Substa.
 †W. G. Perrine, *Supt. Greenhouses, Gardens.*
 *†F. L. Peterson, B. S., (Davis), (Asst.) *Farm Mech.; Asst. Farm Mech.*
 *†B. B. Pratt, B. S., (Asst.) *Pomol.; Asst. Pomol.*
 *†H. J. Quayle, M. S., (Asst.) *Ent.; Asst. Ent.*
 *†C. L. Roadhouse, D. V. M., (Asst.) *Vet. Sci.; Asst. Vet.*
 *†S. S. Rogers, B. S., (Davis), *Instr. Plant Path.; Asst. Plant Path.*
 *†W. A. Setchell, Ph. D., *Bot.*
 †L. T. Sharp, B. S., *Asst. Soil Chem., Bact.*
 *†C. F. Shaw, B. S., *Soil Tech.*
 †Alfred Smith, M. A., *Asst. Soil Tech.*
 †C. O. Smith, M. S., (Whittier), *Asst. Plant Path.*
 †Elizabeth H. Smith, M. S., *Asst. Plant Path.*
 *†R. E. Smith, B. S., *Plant Path.*

- *†R. T. Stevens, B. S., (Asst.) *Landsc. Gard., Asst. Lands. Gard.*
 *†G. R. Stewart, B. S., (Asst.) *Agr. Chem.; Asst. Agr. Chem.*
 *Mattie E. Stover, B. S., *Asst. Nutr.*
 *Thomas Tavernetti, B. S., (Davis), *Asst. to Dean Univ. Farm Sch.*
 *†R. H. Taylor, B. S., (Davis), *Instr. Pomol.; Asst. Pomol.*
 †W. J. Taylor, D. V. M., (El Centro), *Asst. Vet.*
 †E. E. Thomas, B. S., (Whittier), *Asst. Chem.*
 *†J. I. Thompson, B. S., (Davis), (Asst.) *An. Husb.; Asst. An. Husb.*
 *†G. H. True, M. S., (Davis), *An. Husb.*
 †A. R. Tylor, B. S., (Whittier), *Asst. Plant Path.*
 *†E. C. Van Dyke, B. S., M. D., *Instr. Ent.; Asst. Ent.*
 *†H. E. Van Norman, B. S., (Davis), *Dean Univ. Farm Sch., Dairy Mgt.; V. Dir.*
 †E. C. Voorhies, B. S., (Davis), *Asst. An. Husb.*
 †A. E. Way, (Fresno), *Asst. Vit.*
 *†H. J. Webber, Ph. D., D. Agr., (Riverside), *Dean Grad. Sch. Trop. Agr. Plant Brdg.; Dir. Citrus Sta.*
 †W. W. Weir, *Drainage Invest. (Coop. U. S. D. A.).*
 *†E. J. Wickson, M. A., *Hort.*
 *C. J. Wight, B. S., (Davis), *Instr. Bot.*
 *†F. W. Woll, Ph. D., (Davis), *An. Nutr.*
 †C. W. Woodworth, M. S., *Ent.*
 †H. D. Young, B. S., (Whittier), *Asst. Chem.*
 †C. J. Zinn, *Asst. Soil Tech.*

COLORADO.

The State Agricultural College of Colorado and the Agricultural Experiment Station, Fort Collins.

*College faculty. †Station staff.

*C. A. Lory, M. S., LL. D., *President.*

*†C. P. Gillette, M. S., *Dir. Sta. Zool., Ent. (*†)*

- †J. W. Adams, B. S., *Asst. Agron. (Dry Land Invest.), Cheyenne Wells.*
 *Inga M. K. Allison, E. B., *Home Econ.*
 *Charlotte A. Baker, *Libr.*
 *Florence Barlow, B. S., *Instr. Home Econ.*
 *C. L. Barnes, D. V. M., *Materia Medica.*
 †J. D. Bell, *Asst. Irrig. Invest. (Coop. U. S. D. A.).*
 †P. K. Blinn, B. S., *Alfalfa Specialist, Ark. Valley Substa., Rockyford.*
 †L. C. Bragg, *Asst. Ent.*
 *Charlotte E. Carpenter, B. S., *Instr. Home Econ.*
 †V. M. Cone, B. S. in E., *Irrig. Invest. (Coop. U. S. D. A.).*
 †Earl Douglass, M. S., *Asst. Chem.*
 *H. E. Dvorachek, B. S., (Assoc.) *An. Husb.*
 *D. W. Frear, B. S. A., *State Leader Farm Mgt. Invest. (Coop. U. S. D. A.).*
 *J. B. Frisbie, B. S., *Instr. Farm Mech.*
 *†G. H. Glover, M. S., D. V. M., *Vet. Med.; Vet.*
 *Frank Goeder, jr., B. S., *Instr. Phys.*
 *Miriam M. Haynes, B. S., *Instr. Home Econ.*
 *†W. P. Headden, Ph. D., *Chem., Geol.; Chem.*
 *†E. B. House, B. S. in E. E. M. S., *Irrig. Engin.*
 †James Hutton, *Asst. Horse Brdg. (Coop. U. S. D. A.).*
 *†S. A. Johnson, M. S., (Assoc.) *Zool., Ent.; Asst. Ent.*
 †P. S. Jones, B. S., *Asst. Irrig. Invest.*
 *†Alvin Keyser, M. A., *Agron., Farm Mgr.*
 *H. E. Kingman, B. S., D. V. S., *Vet. Surg.*
 †G. M. List, B. S., *Asst. Ent. (Deputy State Ent.).*
 *†B. O. Longyear, B. S., *Bot., For.; Bot.*
 *R. A. McGinty, B. S., *Instr. Hort.*
 *J. D. Marshall, B. S., (Asst.) *Agron.*
 *C. S. Mead, Ph. D., (Asst.) *Zool., Ent.*
 *†G. E. Morton, M. L., B. S. A., *An. Husb.*
 *T. M. Netherton, A. M., *Prin. Sch. of Agr.*
 *†I. E. Newsom, B. S., D. V. S., *Vet. Path.; Path.*
 *S. B. Nuckols, B. S., (Asst.) *Agron.*
 †R. L. Parshall, B. S., *Asst. Irrig. Invest.*
 *Louise Peck, B. S., *Instr. Home Econ.*
 *Oliver Pennock, B. S., (Assoc.) *Irrig. Engin.*
 *F. G. Person, A. M., *Phys.*
 *†W. W. Robbins, M. A., (Asst.) *Bot., For.; Asst. Bot.*
 †E. D. Rood, A. B., *Asst. Chem.*
 †W. G. Sackett, B. S., *Bact.*
 *†E. P. Sandsten, Ph. D., *Hort.*
 *C. G. Sargent, B. A., *Rural Sch. Visitor.*
 *W. R. Thomas, B. A., Litt. D., (Assoc.) *Irrig. Law.*
 †R. E. Trimble, B. S., *Asst. Irrig. Invest.*
 *C. E. Vail, M. A., (Asst.) *Chem.*
 *A. W. Whitehouse, D. V. S., *Vet. Anat.*
 †J. O. Williams, B. S. A., *Horse Brdg. (Coop. U. S. D. A.).*

CONNECTICUT.

Connecticut Agricultural College and the Agricultural Experiment Station, Storrs (telegraph address, *Storrs*, via *Willimantic*; railroad station and express address, *Engleville*).

*College faculty. †Station staff.

*C. L. Beach, B. Agr., B. S., *President*.

†E. H. Jenkins, Ph. D., (*New Haven*) *Dir. Sta.*

*A. F. Blakesley, Ph. D., *Bot.*

*Ethel T. Cousley, *Instr. Home Econ.*

*B. K. Dow, V. S., *Lect. Vet. Sci.*

†H. D. Edmond, B. S., *Chem.*

*†W. M. Esten, M. S., *Bact.*

*W. O. Filley (*New Haven*), *Lect. For.*

*H. L. Garrigus, B. Agr., *Instr. An. Husb., Farm Supt.*

*A. G. Gulley, M. S., *Hort.*

*Maud E. Hayes, A. M., *Home Econ.*

*S. P. Hollister, B. S. A., *Instr. Hort.*

*J. L. Hughes, A. M., *Instr. Chem.*

†Edna E. Jackson, *Asst. Bact.*

*C. D. Jarvis, Ph. D., *Dir. Ext. Work (Coop. U. S. D. A.)*.

*H. K. Job, A. B., *Lect. Ornith. (State Ornith.)*.

*†R. E. Jones, *Asst. Poultry Husb.*

*†H. F. Judkins, B. S., *Instr. Dairy Husb.; Asst. Dairy Husb.*

*†W. F. Kirkpatrick, B. E., B. Agr., *Poultry Husb.*

*†G. H. Lamson, jr., M. S., *Zool., Geol.; Econ. Zool.*

*†J. A. Manter, B. S., *Instr. Zool., Ent.*

†Miss C. J. Mason, B. Agr., *Asst. Bact.*

*H. D. Newton, Ph. D., *Chem.*

†L. F. Rettger, Ph. D., *Bact. (Poultry Diseases)*.

*†W. L. Slate, jr., B. S., *Agron.*

*†B. G. Southwick, B. S., *Instr. Agron.; Asst. Agron.*

*A. T. Stevens, M. S., *Instr. Hort.*

*†G. C. White, M. A., *Dairy Husb.*

*Edwina M. Whitney, Ph. B., *Libr.*

Connecticut State Agricultural Experiment Station, New Haven.

†Station staff.

†E. H. Jenkins, Ph. D., *Dir. Sta.*

†E. M. Bailey, Ph. D., *First Asst. Chem.*

†W. E. Britton, Ph. D. (*Ent. State Ent.*).

†G. P. Clinton, Sc. D., *Bot.*

†Miss V. E. Cole, *Libr.*

†G. L. Davis, *Asst. Chem.*

†I. W. Davis, B. S., *Asst. Ent.*

†Miss E. L. Ferry, A. B., *Research Chem.*

†W. O. Filley, *For. Work. (State For.)*.

†H. K. Hayes, M. S., *Plant Brdg.*

†Q. S. Lowry, B. S., *Asst. Ent.*

†C. B. Morison, B. S., *Asst. Chem.*

†A. E. Moss, M. F., *Asst. For.*

†T. B. Osborne, Ph. D., D. Sc., *Chief Research Chem.*

†C. E. Shepard, *Asst. Chem.*

†E. M. Stoddard, B. S., *Asst. Bot.*

†J. P. Street, M. S., *Chief Anal. Chem.*

†B. H. Walden, B. Agr., *First Asst. Ent.*

†Miss E. B. Whittlesey, *Herbarium Asst.*

DELAWARE.

Delaware College and the Agricultural Experiment Station, Newark.

*College faculty. †Station staff.

*G. A. Harter, Ph. D., *President. Phys. (*)*

*†Harry Hayward, M. S. Agr., *Dean Dept. Agr. Dir. Sta. An. Husb. (*)*

†M. S. Gessner, *Foreman Hort. Dept.*

*†A. E. Grantham, B. S. A., *Agron.*

*†F. B. Hills, M. S., *Instr. An. Husb.; Asst. An. Husb.*

*C. O. Houghton, B. A., *Zool., Bot.*

*†W. A. Lintner, B. S., *Instr. Agron.; Asst. Agron.*

*†C. A. McCue, B. S., *Hort.*

*†T. F. Manns, Ph. D., *Soil Bact., Plant Path.*

†H. H. Morgan, jr., *Asst. Chem.*

*†R. R. Pailthorpe, B. S., *Instr. Hort.; Asst. Hort.*

*C. L. Penny, M. A., *Agr. Chem., Geol.*

*†R. C. Reed, Ph. B., D. V. M., *Vet. Sci., Hyg., Bact.; Vet., An. Path.*

†J. J. Taubenhause, Ph. D., *Asst. Plant Path.*

†William Telfer, *Farm Foreman.*

*†Firman Thompson, B. S., *Agr. Chem.*

*H. E. Tiffany, M. S. (*Asst.*) *Chem.*

†A. C. Whittier, B. S., *Assoc. Chem.*

State College for Colored Students, Dover.

*College faculty.

*W. C. Jason, A. M., D. D., *President.*

*G. W. Deputy, *Field Work, Farm Mech.*

*W. M. Henry, M. D., *Phys., Chem.*

*F. L. Parker, B. S., *Agron., Hort., An. Husb.*

*Helen M. D. Truxon, B. S., *Home Econ.*

FLORIDA.

College of Agriculture and the Agricultural Experiment Station of the University of Florida,
Gainesville.

*College faculty. †Station staff.

*A. A. Murphree, LL.D., *President of University.*

*J. J. Vernon, M. S. A., *Dean Coll. of Agr. Agron. (*)*

*†P. H. Rolfs, M. S., *Dir. Sta. Dir. Ext. Div.*

†John Belling, B. S., *Bot. Editor.*
†O. F. Burger,¹ M. S., *Asst. Plant Path.*
†J. H. Carpenter, A. B., *Asst. Chem.*
†S. E. Collison, M. S., *Chem.*
†M. Crews, *Farm Foreman.*
*H. S. Davis, Ph. D., *Zool., Ent.*
*J. F. Duggar, jr., M. S., *Instr. Soils, Ferts.*
*E. R. Flint, Ph. D., M. D., *Chem.*
†B. F. Floyd, A. M., *Plant Physiol.*
*W. L. Floyd, M. S., *Hort.*
†K. H. Graham, *Auditor.*

*M. B. Hadley, A. B., *Libr.*
†A. C. Mason, B. S., *Ent. Lab. Asst.*
†Julius Matz, B. S., *Plant Path. Lab. Asst.*
*I. D. Odle, B. S., *Instr. Bot., Bact.*
†John Schnabel, *Asst. Hort.*
†J. M. Scott, B. S., *An. Indus., Asst. Dir.*
*†A. P. Spencer, M. S., *V. Dir. Ext. Div.*
†H. E. Stevens, M. S., *Plant Path.*
†S. S. Walker, M. S., *Asst. Chem.*
†J. R. Watson, M. A., *Ent.*
*C. L. Willoughby, B. Agr., *An. Husb., Dairying*

Florida Agricultural and Mechanical College for Negroes, Tallahassee.

*College faculty.

*N. B. Young, M. A., *President.*

*F. H. Cardozo, *Dir. Agr. Dept., Agr.*
*W. H. Crutcher, *Instr. Truck Gard., Farm Crops.*
Farm Supt.
*Evalina A. Davis, *Instr. Cooking.*
*L. E. Graves, B. S., (*Asst.*) *Agr.*
*Bessie L. Headen, B. S., *Asst. Biol., Chem.*
*Edna M. Jenkins, *Instr. Sev.*
*E. B. Jones, B. S., *Chem., Biol.*

*J. F. Matheus, A. B., (*Asst.*) *Phys.*
*Mary E. Melvin, *Actg. Dir. Home Econ. Dept.*
*Ellen O. Paige, *Instr. Dressmaking.*
*Jennie M. Price, *Libr.*
*F. C. Robinson, *Farm Dem.*
*D. A. Sparks, *Instr. An. Husb.*
*Homer Thomas, M. A., (*Asst.*) *Phys.*

GEORGIA.

Georgia State College of Agriculture, Athens, and the Agricultural Experiment Station,
Experiment (telegraph and express address, Griffin).

*College faculty. †Station staff.

*A. M. Soule, Sc. D., *President of College. Dir. State Farmers' Insts.*
†R. J. H. DeLoach, A. M., *Dir. Sta.*

*Alfred Akerman, M. F., *For.*
*J. L. Bishop,² M. S., (*Adj.*) *An. Husb.*
*H. V. Black, Ph. D., (*Assoc.*) *Chem.*
*R. E. Blackburn, *Tutor in Hort.*
*W. M. Burson, D. V. M., *Vet. Sci.*
*J. P. Campbell, Ph. D., *Biol.*
*J. Ph. Campbell,² *State Agt. Ext.-Dem. Work*
(Coop. U. S. D. A.).
*L. M. Carter,² B. S., (*Junior*) *Soil Chem.*
*R. R. Childs,² M. S., *Instr. Agron.*
*G. A. Crabb,² B. S., (*Adj.*) *Agron.*
*B. A. Crane, B. S., *Lect. Cotton Grading.*
*G. E. Downing,² *Pig Club Work (Coop. U. S. D. A.).*
†P. V. Ewing, M. S., *An. Husb.*
*J. R. Fain, B. S., *Agron.*
*G. W. Firor,² M. S., *Ext. Sec. and Hort.*
*J. W. Firor,² B. S., (*Adj.*) *Hort.*
*J. K. Giles,² B. S., *Asst. State Agt. Ext.-Dem. Work*
(Coop. U. S. D. A.).
*O. T. Goodwin, B. S., *Instr. An. Husb.*
*J. W. Hart,² *Dairy Husb. (Coop. U. S. D. A.).*
*L. C. Hart, E. E., *Farm Mech.*

*L. L. Hendren, Ph. D., *Phys.*
†B. B. Higgins, Ph. D., *Bot., Plant Path.*
*M. P. Jarnagin, B. S. A., *An. Husb.*
†Marie Johns, *Libr.*
*L. L. Jones,² B. S., (*Adj.*) *Poultry Husb.*
*D. D. Long,² B. S., *Soil Chem.*
*B. R. H. Lovejoy, B. S., B. L., *Lect. Forest Law.*
*M. W. Lowry, A. B., (*Adj.*) *Soil Chem.*
†C. K. McClelland, M. S. A., *Agron.*
*T. H. McHatton, D. Sc., *Hort.*
*E. T. Miller, C. E., *Instr. Phys.*
*L. E. Rast, B. S., (*Adj.*) *Agron.*
*J. M. Reade, Ph. D., *Bot.*
*H. H. Rothe, B. S., D. V. M., (*Adj.*) *Vet. Sci.*
†H. P. Stuckey, B. S. A., *Hort.*
†J. C. Temple, M. S., *Bact.*
*P. O. Vanatter, *Supt. Field Dem.*
*L. S. Watson, B. S. A., *Instr. Agron.*
†C. A. Wells, M. S., *Chem.*
*†H. C. White, Ph. D., Sc. D., (*Athens*), *Chem.*
*C. A. Whittle, B. S., *Editor, Libr.*
*W. A. Worsham, Jr., A. M., *Agr. Chem.*

¹ On leave.

² In Extension Service.

Georgia State Industrial College for Colored Youths, University of Georgia, Savannah.

*College faculty.

*R. R. Wright, A. M., LL. D., *President*.

*J. S. Frazier, *Instr. Dairying*.

*Mrs. W. G. Hill, *Instr. Dom. Sci.*

*D. C. Suggs, Ph. D., V. Pres., *Dir. Nat. Sci. Dept.*

*R. H. Thomas, *Farm Supt.*

*Mrs. W. P. White, *Instr. Sew., Dressmaking*.

GUAM.

Agricultural Experiment Station, Guam, Island of Guam.

Under the supervision of A. C. True, Director Office of Experiment Stations, U. S. Department of Agriculture.

†Station staff.

†A. C. Hartenbower, B. S., *Agent in charge*.

†L. B. Barber, D. V. M., *Vet., An. Husb.*

†Peter Nelson, *Asst.*

HAWAII.

College of Hawaii, Honolulu

*College faculty.

*J. S. Donaghho, A. M., *Actg. Pres.*

*H. M. Ballou, A. B., *Phys.*

*Elizabeth L. Bryan, Sc. D., *Libr.*

*W. A. Bryan, B. S., *Zool., Geol.*

*L. C. Clark, *Instr. Agr.*

*F. T. Dillingham, S. B., *Chem.*

*J. F. Illingworth, Ph. D., *Ent.*

*F. G. Krauss, B. S., *Agron.*

*Florence M. Lee, B. S., (*Asst.*) *Dom. Sci.*

*Vaughan MacCaughey, B. S. A., *Bot., Hort. Dir. Ext. Work.*

*J. F. C. Rock, *Bot.*

*H. S. Walker, A. B., *Sugar Tech.*

Agricultural Experiment Station, Honolulu.

Under the supervision of A. C. True, Director Office of Experiment Stations, U. S. Department of Agriculture.

†Station staff.

†E. V. Wilcox, Ph. D., *Special Agent*.

†W. A. Anderson, *Supt. Rubber Substa., Hana.*

†J. K. Clark, *Supt. Waipio Substa., Honolulu.*

†F. A. Clowes, *Supt. Substas., Glenwood.*

†George Copp, *Supt. Kula Substa., Waiahoa.*

†D. T. Fullaway, M. A., *Ent.*

†J. E. Higgins, M. S. A., *Hort.*

†V. S. Holt, *Asst. Hort.*

†C. J. Hunn, B. S. A., *Asst. Hort.*

†J. de C. Jerves, *Supt. Substa., Homestead.*

†W. P. Kelley, Ph. D., *Chem.*

†W. T. McGeorge, B. S., *Asst. Chem.*

†C. A. Sahr, *Asst. Agron.*

†Alice R. Thompson, M. A., *Asst. Chem.*

Hawaiian Sugar Planters' Experiment Station, Honolulu.

†Station staff.

†H. P. Agee, B. S., *Dir. Sta.*

†D. C. Broderick, *Supt. Substa.*

†Noel Deerr, A. C. G. I., *Sugar Tech.*

†C. W. Kiesel, *Field Foreman.*

†A. Koebele, *Consult. Ent.*

†E. C. Lane, M. S., *Asst. Chem.*

†L. D. Larsen, B. S., *Asst. Path.*

†H. L. Lyon, Ph. D., *Path.*

†F. Muir, *Assoc. Ent.*

†W. P. Naquin, B. S., *Actg. Agr.*

†R. S. Norris, Ph. D., *Chem. Tech.*

†H. T. Osborn, A. M., *Asst. Ent.*

†S. S. Peck, B. S., Ph. G., *Chem.*

†R. C. L. Perkins,¹ Sc. D., *Ent.*

†W. R. R. Potter, *Illustrator Sta. Pubs.*

†A. T. Speare, A. M., *Asst. Path.*

†O. H. Swezey, M. S., *Actg. Ent.*

†F. R. Werthmueller, B. S., *Asst. Chem.*

¹ On leave.

IDAHO.

College of Agriculture and the Agricultural Experiment Station of the University of Idaho,
Moscow.

* College faculty. † Station staff.

*M. A. Brannon, Ph. D., *President of University. Bot. (*)*

*†W. L. Carlyle, M. S., *Dean Coll. Agr. Dir. Sta.*

†L. C. Aicher, B. S., *Supt. Aberdeen Substa. (Coop. U.S.D.A.).*

*M. F. Angell, Ph. D., *Phys.*

*G. D. Ayers, LL. B., *Lect. Irrig. Law.*

*†C. W. Colver, M. S., *(Asst.) Agr. Chem.; Asst. Agr. Chem.*

*I. W. Cook, M. F., *Instr. For.*

*Norma Davis, B. S., *(Asst.) Home Econ.*

*C. S. Edmundson, B. S., *Prin. Sch. Pract. Agr.*

*†E. V. Ellington, B. S., *(Asst.) Dairy Prod.; Dairyman.*

*†H. P. Fishburn, M. A., *(Asst.) Agr. Chem.; Asst. Agr. Chem.*

*†G. E. Frevert, B. S. A., *(Assoc.) Dairy Mfrs.; Dairyman.*

†Henry Fulmer, B. S., *Asst. Bact.*

*†F. W. Gail, M. A., *Asst. Plant Path.*

*A. R. Hahner, D. V. M., *Vet. Sci.*

*†E. W. Hamilton, B. S. A., B. M. E., *Agr. and Irrig. Engin.; Agr. Engin.*

†C. B. Hampson, *Supt. Caldwell Substa.*

†W. H. Heideman, *Supt. Clagstone Substa.*

*H. A. Holiday, B. A., *Instr. Chem.*

*Jessie M. Hoover, B. S., *Home Econ.*

*Hallie Hyde, B. S., *(Asst.) Home Econ.*

*†E. J. Iddings, B. S., *An. Husb.*

*C. E. Johnson, B. S., *(Boise) Ext. Work.*

*†J. S. Jones,¹ B. S., *Agr. Chem.*

*Amy Kelly, B. S., *(Boise) Ext. Work.*

*†F. L. Kennard, B. S., *Field Crops, Farm Mgt.*

*†J. C. Kinzer, B. S., *(Assoc.) An. Husb.; Asst. An. Husb.*

*J. A. Kostalek, Ph. D., *(Asst.) Chem.*

*†R. A. Lamson, B. S., *Creameryman.*

*Cora I. Lieby, B. S., *(Asst.) Home Econ.*

†Prentice Moore, *Poultryman.*

*†J. F. Nicholson, M. S., *Bact.*

*†P. P. Peterson, Ph. D., *Soils, Soil Phys.*

*†C. V. Schrack, B. S., *Gardener.*

*†J. S. Scott, *Supt. Farms.*

*C. H. Shattuck, Ph. D., *For.*

*C. A. Stewart, Ph. D., *(Assoc.) Geol.*

*Mary B. Sweet, B. L. S., *Libr.*

*E. P. Taylor, B. S., *(Boise) Field Hort.*

*†C. E. Temple, A. M., *Bot.; Plant Path.*

*†C. C. Vincent, M. S. A., *Hort.*

*C. L. von Ende, Ph. D., *Chem.*

†J. S. Welch, *Supt. Gooding Substa. Irrig. Invest. (Coop. U.S.D.A.).*

*J. E. Wodsdalek, Ph. D., *Zool.*

*†W. R. Wright, B. S., *(Asst.) Bact.; Asst. Bact.*

ILLINOIS.

College of Agriculture and the Agricultural Experiment Station of the University of Illinois,
Urbana.

* College faculty. † Station staff.

*E. J. James, Ph. D., LL. D., *President of University.*

*†Eugene Davenport, M. Agr., LL. D., *Dean Coll. Agr. Dir. Sta. Thremmatology. (*)*

*†O. M. Allyn, B. S., *Asst. Crop. Prod.*

†J. P. Aumer, B. S., *Assoc. Chem.*

*F. A. Aust, M. S., *Asst. Landsc. Design.*

*†E. W. Bailey, M. S., *Assoc. Pomol.; Assoc. Plant Brdg.*

*†J. M. Barnhart, M. S., *Asst. Dairy Chem.*

*D. O. Barto, B. S., *Assoc. Poultry Husb.*

*†F. C. Bauer, B. S., *Assoc. Soil Fert.*

*Isabel Bevier, Ph. M., *Household Sci.*

†L. R. Binding, B. S., *Asst. Chem.*

*†J. C. Blair, M. S. A., *Hort.; Chief Hort.*

*†S. J. Bole, A. M., *Assoc. Pomol.*

*†R. E. Brand, M. S., *Assoc. Dairy Husb.*

†Thomas Breger, B. S., *Asst. Plant Brdg.*

†A. M. Brunson, B. S., *Asst. Soil Chem.*

*†Sleeter Bull, M. S., *Assoc. An. Nutr.*

*†W. L. Burlison, M. S., *Assoc. Crop Prod.*

*†W. J. Carmichael, B. S., *Asst. An. Husb.*

*J. H. Checkley, B. S., *Asst. Agr. Ext.*

†E. M. Clark, B. S., *Asst. Dairy Husb.*

†C. B. Clevenger, M. S., *Asst. Chem.*

*†W. C. Coffey, M. S., *Sheep Husb.; Chief Sheep Husb.*

*A. S. Colby, B. S., *Asst. Pomol.*

*†C. S. Crandall, M. S., *Pomol.; Chief Plant Brdg.*

*†W. T. Crandall, M. S., *Assoc. Milk Prod.*

*Nina B. Crigler, B. S., *Assoc. Household Sci.*

*†J. A. Detlefsen, Sc. D., *(Asst.) Genetics; Asst. Chief Genetics.*

†R. W. Dickenson, B. S., *Asst. Soil Phys.*

*I. W. Dickerson, B. S., *Assoc. Farm Mech.*

*†H. B. Dorner, M. S., *(Asst.) Flor.; Asst. Chief Flor.*

*†C. E. Durst, M. S., *Assoc. Oler.*

*E. T. Ebersol, A. B., *Instr. Crop Prod.*

*†W. G. Eckhardt,¹ B. S., *Assoc. Soil Fert.; Asst. Soil Fert.*

*†J. L. Edmonds, B. S., *(Asst.) Horse Husb.; Asst. Chief Horse Husb.*

*K. J. T. Ekblaw, M. S., *Assoc. Farm Mech.*

†O. I. Ellis, B. S., *Asst. Soil Phys.*

†A. D. Emmett, A. M., *Asst. Chief An. Nutr.*

*Augusta D. Evans, B. A., *Asst. Agr. Ext.*

*†H. F. T. Fahrnkopf, B. S., *Asst. Soil Fert.*

*†F. A. Fisher, B. S., *Instr. Soil Phys.; Asst. Soil Phys.*

*†O. S. Fisher, B. S., *(Asst.) Soil Fert.; Asst. Chief Soil Fert.*

- *Georgia Fleming, B. S., *Instr. Textiles.*
 *L. E. Foglesong, B. S., *Instr. Landsc. Gard.*
 *†W. J. Fraser, M. S., *Dairy Farming; Chief Dairy Farming.*
 *†J. J. Gardner, B. S., *Instr. Pomol.; Asst. Pomol.*
 †F. W. Garrett, B. S., *Asst. Soil Fert.*
 †G. E. Gentle, B. S., *Asst. Soil Phys.*
 †W. B. Gernert, Ph. D., *Assoc. Plant Brdg.*
 *†H. C. Gilkerson, B. S., *Asst. Soil Fert.*
 *Nellie E. Goldthwaite, Ph. D., *Household Sci.*
 *Cora E. Gray, M. A., *Assoc. Household Sci.*
 *†H. S. Grindley, Sc. D., *An. Nutr.; Chief An. Nutr.*
 †A. J. Gunderson, B. S., *Asst. Pomol.*
 *†A. F. Gustafson, M. S., *Assoc. Soil Phys.*
 *†L. D. Hall, M. S., (Asst.) *An. Husb.; Asst. Chief An. Husb.*
 *†W. F. Handschin, B. S., *Assoc. An. Husb.*
 *†H. A. Harding, Ph. D., *Dairy Bact.; Chief Dairy Bact.*
 *Florence Harrison, B. S., *Instr. Household Sci., in charge extension.*
 *†A. F. Heck, B. S., *Asst. Soil Fert.*
 *†Leonard Hegnauer, B. S., *Crop Prod.; Chief Crop Prod.*
 *†N. W. Hepburn, M. S., (Asst.) *Dairy Mfrs.; Asst. Chief Dairy Mfrs.*
 *R. W. Hoffman, B. S., *Instr. Landsc. Design.*
 †S. V. Holt, B. S., *Assoc. Soil Phys.*
 *†C. G. Hopkins, Ph. D., *Agron.; V. Dir. Sta. Chief Agron., Chem.*
 †E. E. Hoskins, B. S., *Assoc. Soil Fert.*
 *†R. S. Hulce, B. S. A., *Instr. Milk Prod.; Asst. Milk Prod.*
 †James Hutchinson, *Asst. Flor.*
 *M. E. Jahr, A. B., *Instr. Farm Mech.*
 *A. W. Jamison, M. S., *Assoc. Agr. Ext.*
 *†W. E. Joseph, Ph. D., *Assoc. An. Husb.*
 *†O. A. Keller, B. S., *Asst. Dairy Mfrs.*
 *†LeRoy Lang, M. S., *Assoc. Dairy Mfrs.*
 †W. R. Leighty, B. S., *Asst. Chem.*
 *†J. W. Lloyd, M. S. A., *Oler.; Chief Oler.*
 †C. C. Logan, B. S., *Assoc. Soils Ext.*
 *Donald McIntosh, V. S., *Vet. Sci.*
 *Wilhelm Miller, Ph. D., (Asst.) *Landsc. Hort.*
 *W. P. Miller, B. S., *Asst. Agr. Ext.*
 †H. H. Mitchell, M. S., *Assoc. Chem.*
 *†J. G. Mosier, B. S., *Soil Phys.; Chief Soil Phys.*
 *†H. W. Mumford, B. S., *An. Husb.; Chief An. Husb.*
 †F. W. Muncie, A. B., *Asst. Flor.*
 *†C. I. Newlin, B. S., *Asst. An. Husb.*
 †Gertrude Niederman, B. S., *Asst. Chem.*
 *Aretas W. Nolan, M. S., (Asst.) *Agr. Ext.*
 †J. B. Park, M. S., *Assoc. Plant Brdg.*
 *†H. N. Parker, *Instr. Milk Distrib.; Asst. Milk Distrib.*
 *Maud Parsons, B. S., *Instr. Household Sci.*
 *†F. A. Pearson, B. S., *Asst. Dairy Husb.*
 *H. W. Peaslee, B. Arch., *Instr. Landsc. Design.*
 †G. L. Peltier, A. M., *Asst. Flor. Path.*
 *†J. H. Pettit, Ph. D., *Soil Fert.; Chief Soil Fert.*
 *†B. S. Pickett, M. S., (Asst.) *Pomol.; Asst. Chief Pomol.*
 *Helena M. Pincomb, B. S., *Assoc. Household Sci.*
 †B. E. Powell, Ph. D., *Editor Agr. Pub.*
 *†M. J. Prucha, Ph. D., (Asst.) *Dairy Bact.; Asst. Chief Dairy Bact.*
 *F. H. Rankin, *Supt. Agr. Ext.; Asst. to Dean.*
 *C. O. Reed, B. S., *Instr. Farm Mech.*
 *†C. C. Rees, A. B., *Asst. Hort. Path.*
 †H. L. Rietz, Ph. D., *Statistician.*
 †Elmer Roberts, B. S., *Asst. Genetics.*
 *C. M. Robinson, M. A., *Civic Design.*
 *R. R. Root, M. L. A., (Asst.) *Landsc. Gard.*
 *†H. A. Ruehe, M. A., *Instr. Dairy Mfrs.; Asst. Dairy Mfrs.*
 *†H. P. Rusk, M. S. A., (Asst.) *Cattle Husb.; Asst. Chief Cattle Husb.*
 †W. A. Ruth, A. M., *Assoc. Hort. Chem.*
 †W. H. Sachs, B. S., *Assoc. Chem.*
 *†C. B. Sayre, B. S., *Instr. Oler.; Asst. Oler.*
 *†W. R. Schoonover, B. S., *Asst. Soil Fert.; Asst. Soil Biol.*
 *Lurene Seymore, B. S., *Assoc. Household Sci.*
 *†F. M. Simpson, B. S., *Instr. An. Husb.; Asst. An. Husb.*
 *F. A. C. Smith, M. L. A., *Instr. Landsc. Design.*
 *†L. H. Smith, Ph. D., *Plant Brdg.; Chief Plant Brdg.*
 *†W. H. Smith, M. S., *Instr. An. Husb.; Asst. An. Husb.*
 *†H. J. Snider, B. S., *Asst. Soil Fert.*
 *Grace E. Stevens, A. B., *Instr. Household Sci.*
 *†H. W. Stewart, B. S., *Assoc. Soil Phys.*
 †Ernest Van Alstine, B. S., *Assoc. Chem.*
 *†E. H. Walworth, B. S., *Asst. Crop Prod.*
 †F. M. W. Wascher, B. S., *Asst. Soil Phys.*
 *†O. S. Watkins, B. S., *Assoc. Hort. Chem.*
 *†J. R. Wells, B. S., *Asst. An. Husb.*
 †H. C. Wheeler, B. S., *Assoc. Soil Phys.*
 *Ruth Wheeler, A. B., *Assoc. Household Sci.*
 †J. E. Whitechurch, B. S., *Assoc. Soil Fert.*
 *E. A. White, M. S., *Assoc. Farm Mech.*
 *†A. L. Whiting, Ph. D., *Assoc. Soil Biol.*
 *W. W. Yapp, B. S., *Asst. Dairy Husb.*
 *†J. J. Yoke, B. S., *Asst. An. Husb.*

INDIANA.

The School of Agriculture and the Agricultural Experiment Station of Purdue University,
 La Fayette.

*College faculty. †Station staff.

*W. E. Stone, Ph. D., LL. D., *President of University.*

*†J. H. Skinner, B. S., *Dean School Agr. An. Husb. (*)*; *Chief An. Husb. (†)*

†Arthur Goss, M. S., A. C., *Dir. Sta.*

†J. B. Abbott, M. S., *Assoc. Soils.*

*H. E. Allen, B. S., (Asst.) *An. Husb.*

†L. Evelyn Allison, B. S., *Asst. Bot.*

*†J. C. Arthur, D. Sc., *Veg. Physiol., Path.; Chief Bot.*

†J. C. Beavers, B. Agr., *Assoc. Soils and Crops Ext.*

†R. O. Bitler, B. S., *Deputy State Chem.*

*†J. G. Boyle, M. S., (Asst.) *Hort.; Asst. Hort.*

*†R. E. Caldwell, B. S., *Instr. Milk Prod.; Assoc. Milk Prod.*

*R. H. Carr, Ph. D., *Instr. Agr. Chem.*

¹ On leave.

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 *†H. H. Kildee, B. S. A., (*Assoc.*) *An. Husb., Supt. Dairy Farm; Asst. Chief Dairy Husb.*
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- *E. C. Johnson, M. A., *Supt. Farmers' Insts. State Leader (Coop. U. S. D. A.).*

1 On leave.

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 *†W. A. Lippincott, B. S., *Poultry Husb.*
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 *†F. S. Merrill, B. S., *Asst. Hort.*
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 *J. H. Miller, A. M., *Dir. Ext. Div.*
 †O. C. Miller, *Feed Insp.*
 *R. W. Miller, A. B., *Asst. Chem.*
 *R. V. Murphy, B. S., *Asst. Chem.*
 *†R. K. Nabours, Ph. D., *Zool.; Zool. and An. Genetics Invest.*
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 *G. E. Raburn, *Asst. Phys.*
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 *Ida Rigney, B. S., *Instr. Dom. Sci.*
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 *†B. S. Wilson, B. S., *Asst. Farm Dem.; Asst. Coop. Expts.*
 *F. A. Wirt, B. S. C. E., *Asst. Farm Mech.*
 *†H. B. Yocum, B. A., *Asst. Zool.; Injurious Mammals.*

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College of Agriculture and the Agricultural Experiment Station of the State University,
 Lexington.

*College faculty. †Station staff.

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 †W. S. Anderson, M. A., *Asst. An. Husb.*
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 †L. A. Brown, Ph. D., *Chem. (Food and Drugs).*
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 †G. D. Buckner, Ph. D., *Chem. (Research).*
 †J. H. Carmody, B. S., *Ext. Asst. in Hort.*
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 †H. E. Curtis, M. S., *Head Fert. Dept. Bursar.*
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 *†Robert Graham, D. V. M., B. S., (*Asst.*) *Vet. Sci.; Vet. (Hog Cholera Serum).*
 †D. J. Healy, M. D., *Bact. (Research).*

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 †F. W. Hofmann, M. A., *Asst. Hort.*
 *†J. J. Hooper, M. S. A., *Head An. Husb. Dept.*
 (*Dairy Cattle, Horses, Poultry*).
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 †H. H. Jewett, M. A., *Asst. Ent., Bot. (Research)*.
 †R. W. Jones, *Insp. (Feeds and Fert.)*.
 *†S. C. Jones, M. S., (*Asst.*) *Soil Phys.; Asst. Agron.*
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 *†R. E. Knapp, B. S., (*Asst.*) *Bact.*
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 *A. McQ. Miller, A. M., *Geol.*
 †E. W. Mumma, V. M. D., *Asst. in Hog Cholera Serum*.
 *D. S. Myer, *Asst. in Farm Crops*.
 *†W. D. Nicholls, B. S., (*Asst.*) *Dairy Husb.; Asst. An. Husb.*
 *†H. R. Niswonger, M. A., *Instr. Zool., Ent.; Asst. Nursey Insp. (Ent., Bot.)*.

The Kentucky Normal and Industrial Institute for Colored Persons, Frankfort.

*College faculty.

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 *R. W. James, *Dir. Agr. Dept.*
 *Mrs. Anna T. O'Neal, *Instr. Dom. Art.*

- †J. W. Nutter, *Supt. Dairy Farm*.
 *M. L. Pence, M. S., *Phys.*
 †A. M. Peter, D. Sc., *Head Chem. Dept.*
 †W. R. Pinnell, M. D., *Bact. (Food and Drugs)*.
 †R. L. Pontius, V. S., *Asst. in Hog Cholera Serum Administration*.
 †C. S. Porter, A. B., Ph. G., *Insp. Drugs*.
 *H. W. Rickey, *Ext. Work in Poultry*.
 *†George Roberts, M. S., *Agron.; Head Agron. Dept.*
 †Wm. Rodes, jr., M. S., *Asst. Chem. (Fert.)*.
 †Walter Scheppelman, *Bakery Expert (Food and Drugs)*.
 †O. M. Shedd, M. S., *Chem. (Research)*.
 †D. D. Slade, *Supt. Poultry Farm*.
 †W. V. Smith, *Asst. An. Husb.*
 †H. D. Spears, M. S., *Chem. (Feed Dept.)*.
 *Mary E. Sweeney, M. S., (*Assoc.*) *Household Sci.*
 *R. C. Terrell, C. E., *Rural and Highway Engin.*
 †W. G. Terrell, *Insp. (Food and Drugs)*.
 †J. D. Turner, LL. B., *Head Feed Dept.*
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 *†E. C. Vaughn, A. B., (*Asst.*) *Ent., Bot.; Asst. Ent. Bot.*
 *W. S. Webb, M. S., (*Asst.*) *Phys.*
 †B. D. Wilson, B. S., *Asst. Chem. (Fert.)*.
 †E. F. Worthington, B. S., *Insp. (Food and Drugs)*.

LOUISIANA.

The Louisiana State University and Agricultural and Mechanical College and the State Experiment Station, Baton Rouge; the Sugar Station, Audubon Park, New Orleans; the North Louisiana Station, Calhoun; and the Rice Station (Coop. U. S. D. A.), Crowley.

*College faculty. †Station staff.

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*†W. R. Dodson, B. S., *Dean Agr. Coll. Dir. Stations. Agr. (*)*

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 *W. H. Balis, B. S., *Asst. Dir. Agr. Ext.*
 *A. T. Bell, A. M., *Bot., Bact.*
 †S. Byall, B. S., *Asst. Chem.*
 †G. D. Cain, B. S., *Asst. Chem.*
 *C. E. Coates, Ph. D., *Chem.*
 †W. E. Cross, Ph. D., *Chem., Sugar Sta.*
 *†W. H. Dalrymple, M. R. C. V. S., *Vet. Sci.; Vet.*
 *E. B. Doran, B. S., *Prim. Sch. of Agr.*
 †C. W. Edgerton, Ph. D., *Plant Path.*
 †F. V. Emerson, Ph. D., *Geol.*
 *F. G. Fournet, B. S., *Instr. Phys.*
 †J. B. Garrett, B. S., *Asst. Dir. N. La. Sta.*
 *W. H. Gates, B. A., *Zool., Ent.*
 †G. G. Gremillion, *Farm Mgr., Sugar Sta.*
 *D. V. Guthrie, Ph. D., *Phys.*
 †J. M. Jennings, B. S., *Asst. Chem.*
 *E. L. Jordan, B. S., *An. Husb.*
 *Elizabeth B. Kelley, *Home Econ., Ext. Div.*
 †A. P. Kerr, M. S., *Asst. Chem.*
 †E. W. Kerr, M. E., *Mech. Engin.*
 *A. F. Kidder, B. S., *Agron.*
 *†R. Lecompte, B. A., *Instr. Chem.*

- *J. G. Lee, B. S., *For., Hort.*
 †U. C. Loftin, M. S., *Ent. Asst., Sugar Sta. (Coop. U. S. D. A.)*.
 †J. K. McHugh, *Sec., Sugar Sta.*
 *R. L. Menville, M. S., (*Asst.*) *Chem.*
 †C. C. Moreland, B. S., *Asst. Plant Path.*
 †Harry Morris, D. V. M., *Bact., Asst. Vet.*
 *Inez Mortland, B. L. S., *Libr.*
 *F. Odell, D. Sc., *Chem.*
 †W. L. Owen, B. S., *Bact., Sugar Sta.*
 †A. J. Parent, *Farm Mgr.*
 *E. M. Percy, B. S., *Instr. Sugar Chem. and Engin.*
 *N. F. Petersen, B. A., *Instr. Bot.*
 †F. C. Quereau, M. S., *Asst. Dir. Rice Sta.*
 *E. S. Richardson, B. S., *Dir. Agr. Ext.*
 †I. Selector, B. S., *Asst. Chem.*
 †C. H. Staples, B. S., *Dairying (Coop. U. S. D. A.)*.
 †Mrs. E. L. Strong, *Sec.*
 †R. P. Swire, B. A., *Treas.*
 †W. G. Taggart, B. S., *Asst. Dir. Sugar Sta.*
 †G. L. Tiebout, B. S., *Hort., in charge Truck Farm.*
 †E. S. Tucker, *Assoc. Ent.*
 †E. J. Watson, *Hort., N. La. Sta.*

¹ On leave.

**Southern University and Agricultural and Mechanical College of the State of Louisiana,
Scotland Heights, Baton Rouge.**

*College faculty.

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*J. M. Harris, *Dir. Agr. Dept., Agr.*

*J. F. McKoy, *Farm Mgr.*

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*Miss C. A. Mitchell, *Instr. Sewing.*

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**College of Agriculture and the Agricultural Experiment Station of the University of Maine,
Orono.**

* College faculty. † Station staff.

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*L. S. Merrill, M. D., *Dean Coll. Agr. Dir. Ext. Service.*

†C. D. Woods, Sc. D., *Dir. Sta.*

†H. C. Alexander, *Lab. Asst. Chem.*

*R. H. Ashley, Ph. D., *Instr. Chem.*

*V. G. Aubry, B. S., *Instr. An. Indus. (Poultry).*

†Alice W. Averill, *Lab. Asst. Ent.*

†Helen W. Averill, B. S., *Asst. Chem.*

†C. W. Barber, B. S., *Asst. Biol.*

*H. B. Barrows, B. A., *Instr. Biol.*

†J. M. Bartlett, M. S., *Chem.*

*Dorothea Beach, *Instr. Home Econ.*

*F. H. Bickford, *State Leader Boys' and Girls' Agr. Clubs.*

*E. N. Boland, M. S., *Instr. An. Indus.*

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*H. N. Conser, M. S., (*Asst.*) *Bot.*

*L. S. Corbett, M. S., *An. Indus.*

†Maynie R. Curtis, Ph. D., *Asst. Biol.*

*C. A. Day, *Farm Dem. Work.*

*A. L. Deering, B. S., *Farm Dem. Work.*

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*C. W. Eaton, M. F., *Instr. For.*

†Vernon Folsom, *Lab. Asst. Plant Path.*

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†H. H. Hanson, M. S., *Assoc. Chem.*

*E. F. Hitchings, C. E., M. S., (*Assoc.*) *Hort.*

*R. M. Holmes, M. A., *Instr. Phys.*

*O. A. Jamison, B. S. A., *Instr. An. Indus. (Dairy Mfrs.).*

*Earl Jones, M. S., *Instr. Agron (Soils).*

*M. D. Jones, B. S., *Farm Dem. Work.*

*R. K. Jones, B. S., *Libr.*

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†Hazel F. Mariner, B. A., *Asst. Computer.*

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†Raymond Pearl, Ph. D., *Biol.*

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†Michael Shapovalov, M. S., *Asst. Plant Path.*

*G. E. Simmons, M. S., *Agron.*

†Wellington Sinclair, (*Monmouth*), *Supt. Highmoor Farm.*

*H. W. Smith, B. S., *Instr. Bact.*

*J. S. Stevens, M. S., LL. D., *Phys.*

*J. N. Stevenson, M. S., *Instr. Chem.*

*E. M. Straight, B. S., *Farm Dem. Work.*

†F. M. Surface, Ph. D., *Biol.*

†Frank Tenney, *Poultryman.*

†E. R. Tobey, B. S., *Asst. Chem.*

*V. M. Transue, M. S., *Instr. Phys.*

*E. O. Whittier, B. S., *Instr. Chem.*

*L. E. Woodman, Ph. D., (*Assoc.*) *Phys.*

*G. N. Worden, B. S., *Farm Dem. Work.*

*G. A. Yeaton, *Farm Dem. Work.*

MARYLAND.

Maryland Agricultural College and the Agricultural Experiment Station, College Park.

* College faculty. † Station staff.

*†H. J. Patterson, D. Sc., *President of College. Dir. Sta. Chem.(†)*

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†R. S. Allen, *Asst. Swine Husb.*

*B. W. Anson, B. S., (*Assoc.*) *Landsc. Gard., Flor.*

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†W. R. Ballard, B. S., *Pomol., Small Fruits.*

*Herman Beckenstrater, M. S., *Pomol.*

*F. W. Besley, M. F., *Lect. For.*

†B. M. Bolton, M. D., *Biol.*

*†Reuben Brigham, B. S., *Lect. Sheep Husb.; Sheep Husb.*

†E. H. Brinkley, *Farm Supt.*

*†L. B. Broughton, M. S., (*Assoc.*) *Chem.; Asst. Chem.*

*†S. S. Buckley, M. S., D. V. S., *Vet. Sci.; An. Path.*

*L. L. Burrell, B. S., (*Asst.*) *Small Fruits.*

*E. N. Cory, M. S., (*Assoc.*) *Ent., Zool.*

*Myron Creese, E. E., *Phys.*

*†Herschel Ford, Ph. B., *Treas.*

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†R. W. Lamson, B. S., *Asst. Chem.*

*H. B. McDonnell, M. S., M. D., *Chem. (State Chem.)*

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 *†J. B. S. Norton, M. S., *Veg. Path., Bot. State Path.*
 †C. L. Opperman, *Swine Husb.*
 *C. G. Remsburg, B. S., *Asst. Chem.*
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 †Nickolas Schmitz, M. S., *Agron.*
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 *G. P. Springer, B. S., *Instr. Phys.*
 *†T. B. Symons, M. S., *Ent., Zool.; Hort. Dem. (State Work).*
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 †R. C. Towles, *Libr.*
 †R. H. Waite, B. S., *Poultryman.*
 †G. E. Walcott, M. S., *Dairy Ext. Work.*
 *N. R. Warthen, B. S., *Instr. Phys.*
 †H. J. White, B. S., *Asst. Chem.*
 †T. H. White, *Veg., Flor.*

Princess Anne Academy for Colored Persons, *Princess Anne.*

*College faculty.

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 *H. J. Hitch, *Market Gard.*
 *Olive C. Madella, *Dom. Sci., Art.*

- *J. E. Smith, *Phys. Sci., Agr.*
 *William Smith, *Drainage, Farm Foreman.*

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Massachusetts Agricultural College and the Agricultural Experiment Station, *Amherst.*

*College faculty. †Station staff.

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 *F. N. Blanchard, B. S., *Instr. Zool., Geol.*
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 †A. I. Bourne, B. A., *Asst. Ent.*
 *A. A. Brown, B. S., *Instr. Poultry Husb.*
 †J. P. Buckley, *Asst. Chem.*
 *J. L. Byard, *Supt. of Apiary.*
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 †G. H. Chapman, M. S., *Research Physiol., Path.*
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 †O. L. Clark, B. S., *Asst. Bot.*
 *W. D. Clark, M. F., *For.*
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 *Samuel Coons, *Buttermaker.*
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 †E. K. Dexter, *Observer.*
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 *R. H. Ferguson, B. S. A., *Agr. Econ., Ext. Service.*
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 *†H. T. Fernald, Ph. D., *Ent.*
 *†J. A. Foord, M. S., *Head Div. Agr., Farm Admin.*
 *E. H. Forbush, *Supervisor Corresp. Courses.*
 †H. J. Franklin, Ph. D., *Cranberry Invest.*
 †W. S. Frost, B. S., *Asst. Chem.*
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 †E. F. Gaskill, B. S., *Asst. Agr.*
 *†B. N. Gates, Ph. D., (*Asst.*) *Bee Keeping; Apiarist.*
 †H. D. Goodale, Ph. D., *Research Biol. (Poultry Husb.).*
 *C. E. Gordon, Ph. D., (*Assoc.*) *Zool., Geol.*
 *†J. C. Graham, B. S., *Poultry Husb.*
 *†C. R. Green, B. Agr., *Libr.*

- *A. K. Harrison, *Instr. Landsc. Gard.*
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 †H. D. Haskins, B. S., *Chem., Head Fert. Div.*
 †E. B. Holland, M. S., *Assoc. Chem., Head Research Div.*
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 *A. F. McDougall, B. S., *in charge Automobile Dem. Outfit.*
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 †F. W. Morse, M. S., *Research Chem.*
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 *†J. B. Paige, B. S., D. V. S., *Vet. Sci.; Vet.*
 *C. A. Peters, Ph. D., (*Assoc.*) *Inorg. and Soil Chem.*
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 *F. W. Rane, M. F., (*Boston*), *Lect. on For.*
 *R. W. Rees, B. S., *Pomol., Ext. Service.*
 *H. E. Robbins, M. A., (*Asst.*) *Phys.*
 †R. W. Ruprecht, B. S., *Asst. Chem.*
 *†F. C. Sears, M. S., *Pomol.*

† On leave.

- †J. K. Shaw, Ph. D., *Research Pomol.*
 †P. H. Smith, M. S., *Chem., Head Feed and Dairy Div.*
 *†G. E. Stone, Ph. D., *Plant Path., Physiol.; Bot., Veg. Physiol. and Path.*
 *G. F. E. Story, B. S., *Dairying, An. Husb., Ext. Service.*

- *F. H. H. Van Suchtelen, Ph. D., (*Asst.*) *Micro biol.*
 *E. D. Waid, B. S., *Asst. Dir. Ext. Service.*
 †L. S. Walker, B. S., *Asst. Chem.*
 *†F. A. Waugh, M. S., *Head Div. Hort., Landsc. Gard.; Hort.*
 *Charles Wellington, Ph. D., *Chem.*

MICHIGAN.

The Michigan Agricultural College and the Agricultural Experiment Station, East Lansing.

*College faculty. †Station staff.

- *J. L. Snyder, Ph. D., LL. D., *President.*
 *†R. S. Shaw, B. S. A., *Dean of Agr. Dir. Sta.*

- *A. L. Allen, B. S., *Instr. Dairy Mfrs.*
 *Ruth F. Allen, Ph. D., *Instr. Bot.*
 *†A. C. Anderson, B. S., *Dairy Husb.*
 *†J. F. Baker, M. F., *For.*
 *R. J. Baldwin, B. S., *Supt. Ext. Work.*
 *W. B. Barrows, B. S., *Zool., Physiol.*
 *W. J. Beal, Ph. D., D. Sc., *Bot. Emeritus.*
 *Rachel M. Benham, B. S., *Instr. Bact.*
 *F. W. Bentzen, B. S., *Instr. Chem.*
 *†E. A. Bessey, Ph. D., *Bot.*
 †A. M. Brown, A. B., *Sec., Treas.*
 *†C. W. Brown, B. S., *Instr. Bact.; Research Asst. Bact.*
 *†G. A. Brown, B. S., (*Asst.*) *An. Husb.; Asst. An. Husb.*
 *F. A. Burt, B. S., *Instr. Zool.*
 †R. G. Carr, B. S., *in charge Chatham Substa.*
 *F. W. Chamberlain, B. S., D. V. M., (*Asst.*) *Comp. Anat.*
 *C. W. Chapman, B. S., (*Asst.*) *Phys.*
 *A. J. Clark, A. B., (*Asst.*) *Chem.*
 *A. C. Conger, M. A., *Instr. Zool.*
 *E. H. Conroy, *Instr. Chem.*
 †L. H. Cooledge, A. M., *Research Asst. Bact.*
 *†G. H. Coons, A. M., *Instr. Plant Path.; Research Asst. Plant Path.*
 *J. F. Cox, B. S., *Instr. Farm Crops.*
 *H. E. Dennison, B. S., *Instr. Dairy Husb.*
 *Richard de Zeeuw, Ph. D., (*Asst.*) *Bot.*
 *†W. C. Dutton, B. S., *Asst. Hort.*
 *†H. J. Eustace, M. H., *Hort.*
 *F. E. Fogle, *Asst. Farm Mech.*
 *W. H. French, M. Pd., M. S., *Agr. Ed.*
 *Irving Gilson, M. F., *Instr. For.*
 *†Ward Giltner, D. V. M., M. S., (*Actg.*) *Bact. and Hyg.; Bact.*
 *E. L. Grover, B. S., *Asst. Agr. Ed.*
 *Thomas Gunson, *Instr. Hort.*
 *†C. P. Halligan, B. S., (*Assoc.*) *Hort.; Asst. Hort.*
 *†E. T. Hallman, D. V. M., *Instr. Bact.; Research Asst. Bact.*
 *B. E. Hartsuch, A. B., *Instr. Chem.*
 *†R. P. Hibbard, Ph. D., *Instr. Plant Physiol.; Research Asst. Plant Physiol.*
 *†L. R. Himmelberger, B. S., *Instr. Bact.; Asst. Bact.*
 *Linda L. Himmelein, *Instr. Dom. Art.*
 *Bertha M. Hollister, *Seed Analyst.*
 *R. S. Hudson, B. S., *Farm Foreman.*
 *Agnes Hunt, B. S., *Dom. Sci.*
 *R. C. Huston, M. S., (*Asst.*) *Chem.*
 *J. P. Hutton, D. V. M., (*Asst.*) *Vet. Surg.*

- *G. R. Johnstone, B. A., *Instr. Bot.*
 *F. C. Kaden, B. S., *Instr. Chem.*
 †P. E. Karraker, B. S., *Research Asst. Soil Phys.*
 *F. S. Kedzie, D. Sc., *Chem.*
 *S. V. Klem, M. F., *Instr. For.*
 *W. E. Laycock, *Instr. Phys.*
 *†Mrs. Linda E. Landon, *Libr.*
 *V. E. Leroy, M. S., *Instr. Zool.*
 *†J. O. Linton, B. S., (*Asst.*) *Poultry Husb.; Asst. Poultry Husb.*
 *W. L. Lodge, M. A., (*Asst.*) *Phys.*
 *R. E. Loree, B. S., *Instr. Hort.*
 *R. P. Lyman, B. S., M. D. V., *Dean Vet. Dept. Vet. Med.*
 *†Eugenia I. McDaniel, B. S., *Instr. Ent.; Asst. Ent.*
 *J. S. McDaniel, B. S., D. V. S., (*Asst.*) *Vet. Med., Pharm.*
 *F. E. Millen, *Instr. Ent.*
 *J. R. Mitchell, A. B., *Instr. Chem.*
 †J. F. Morgan, M. A., *Research Asst. Bact.*
 *Eben Mumford, Ph. D., *State Dir. Farm Mgt. Field Studies.*
 †J. H. Muncie, M. A., *Asst. Path.*
 *†H. H. Musselman, B. S., (*Asst.*) *Farm Mech.; Asst. Farm Mech.*
 *C. E. Newlander, B. S., *Instr. Dairy Husb.*
 *†L. Zae Northrop, M. H. E., (*Asst.*) *Bact. and Hyg.; Asst. Bact.*
 †I. R. Noteware, *in charge South Haven Substa.*
 †A. J. Patten, B. S., *Chem.*
 *Mrs. Lillian L. Peppard, *Actg. Dean Home Econ., Instr. Dom. Art.*
 *†R. H. Pettit, B. S. A., *Ent.*
 *A. R. Potts, *Soils and Crops Field Agt.*
 *F. S. Prince, B. S., *Instr. Soils.*
 *W. F. Raven, *Live Stock Field Agt.*
 *G. A. Reddick, A. B., *Instr. Chem.*
 *Virginia C. Richeson, B. S., *Instr. Dom. Sci. and Art.*
 *F. T. Riddell, B. S., *Field Invest. Dairying.*
 *W. S. Robbins, B. S., *Asst. Bact.*
 †C. S. Robinson, M. S., *Research Asst. Chem.*
 *E. Lutie Robinson, B. S., *Instr. Dom. Art.*
 *B. B. Rosenboom, Jr., B. S., *Instr. Zool.*
 *F. H. Sanford, M. F., (*Asst.*) *For.*
 *A. R. Sawyer, E. E., *Phys.*
 *D. A. Seeley, B. S., *Instr. Met.*
 *†G. D. Shafer, Ph. D., (*Asst.*) *Ent.; Research Asst. Ent.*
 *†V. M. Shoesmith, B. S., *Farm Crops.*
 *O. L. Snow, B. S., *Instr. Phys.*
 *D. A. Spencer, B. S., *Instr. An. Husb.*

- *†F. A. Spragg, M. S., *Instr. Plant Brdg.; Research Asst. Farm Crops.*
 *†C. H. Spurway, B. S., *Instr. Soil Phys.; Soil Phys.*
 *L. R. Taft, M. S., *Supt. Farmers' Insts. State Insp. Orchards and Nurseries.*
 *Rose M. Taylor, M. A., *Instr. Bot.*

- *Bertha E. Thompson, A. B., *Instr. Bot.*
 †J. H. Torrence, B. S., *Asst. Chem.*
 *C. R. Tylor, *For. Field Agt.*
 *O. K. White, B. S., *Hort. Field Agt.*
 †O. B. Winter, B. S., *Asst. Chem.*
 *G. C. Woodin, B. S. A., *Instr. Ent.; Asst. Ent.*

MINNESOTA.

College and School of Agriculture and the Agricultural Experiment Station of the University of Minnesota, University Farm, St. Paul.

*College faculty. †Station staff.

- *G. E. Vincent, Ph. D., LL. D., *President of University.*
 *†A. F. Woods, M. A., D. Agr., *Dean Coll. and Sch. Agr. Dir. Sta.*
- *†J. H. Allison, Ph. B., M. F., *For.; Asst. For.*
 *†F. J. Alway, Ph. D., *Soils.*
 †Stephen Anthony, *Chem. (An. Nutr. Invest.).*
 *†A. C. Arny, B. S. in A., *(Asst.) Agron.; Asst. Agron.*
 *†R. C. Ashby, B. S., *Instr. An. Husb.; Asst. An. Husb.*
 †O. G. Babcock, B. S., *Asst. Ent.*
 *†C. H. Bailey, B. S., *Instr. Cereal Chem.; Cereal Tech.*
 *G. J. Baker, M. S. in A., *Farm Mgt. Ext., Supt. Dem. Farms.*
 *Margaret B. Baker, *Home Econ., Ext. Div.*
 *F. E. Balmer, B. S. A., *District Agt. (Coop. U. S. D. A.).*
 *†L. B. Bassett, *(Asst.) Farm Mgt.; Asst. Farm Mgt.*
 *Bessie E. Bemis, B. S., *Instr. Foods, Cookery.*
 *†A. H. Benton, M. S., *(Asst.) Farm Mgt.; Asst. Farm Mgt.*
 *C. A. Berg, *(Crookston), Instr. Farm Mech.*
 *†O. I. Bergh, B. S. in A., *(Crookston), Instr. Agron.; Agron.*
 *Josephine T. Berry, M. A., *Home Econ., Nutr.*
 *Mrs. Margaret J. Blair, *(Asst.) Dom. Art.*
 *†Andrew Boss, *Agron., Farm Mgt.*
 *Fannie C. Boutelle, *Instr. Dom. Econ.*
 *†W. L. Boyd, D. V. S., *(Asst.) Vet. Med.; Asst. Vet.*
 *†W. G. Brierley, M. S., *(Asst.) Hort.; Asst. Pomol.*
 *†C. E. Brown, *(Crookston), Instr. Poultry; Poultryman.*
 *Ch. E. Brown, *Ext. Short Courses.*
 *†A. M. Bull, *(Asst.) Farm Structures; Engin.*
 *†C. P. Bull,¹ B. Agr., *(Assoc.) Agron.; Assoc. Plant Brdg.*
 *Mary L. Bull, *Home Econ., Ext. Div.*
 *†Le Roy Cady, B. S. in A., *(Assoc.) Hort.; Assoc. Hort.*
 †W. F. Cantwell, B. S. in Ch., *Asst. Chem. (An. Nutr. Invest.).*
 †Alex. Carlyle, *Asst. Plant Brdg.*
 *†W. L. Cavert, Ph. B., B. S., *Instr. Farm Mgt.; Asst. Farm Mgt.*
 *N. E. Chapman, B. D., A. M., *Poultry, Ext. Div.*
 *†E. G. Cheyney, B. A., *For.*
 *F. C. Cornica, B. S. in A., *Instr. Agron.*
 †R. C. Dahlberg, B. S. in A., *Seed Analyst.*
- *E. C. Davis, B. S. in A. H., *Instr. Agr. Ed., Ext. Div.*
 *†William Dietrich, M. S., *(Crookston), Instr. An. Husb.; An. Husb.*
 †J. T. Dinwoodie, V. M. D., *Asst. Vet.*
 *R. L. Donovan, B. S. in A., *Dem. Farms, Ext. Div.*
 *†M. J. Dorsey, Ph. D., *(Asst.) Fruit Brdg.; Fruit Brdg.*
 *J. M. Drew, *Registrar.*
 †E. D. Durand, Ph. D., *Dir. Statistical Research.*
 *T. A. Erickson, B. A., *Rural Schs., Ext. Div. (Coop. U. S. D. A.).*
 †Agnes Ericson, *Asst. Chem. (An. Nutr. Invest.).*
 *A. L. Ewing, M. S., *Instr. Phys.*
 *W. H. Frazier,¹ B. S., *(Asst.) Soils.*
 *†E. M. Freeman, Ph. D., *Asst. Dean. Bot., Plant Path.*
 *†R. H. Giberson, *(Morris), Instr. Dairy Husb.; Dairy Husb.*
 *†T. L. Haecker, *Dairy and An. Husb., An. Nutr.*
 *†W. F. Hagerman, B. S. in A., *Instr. An. Husb.; Asst. An. Husb.*
 †Mildred H. Haggard, B. A., *Chem. (An. Nutr. Invest.).*
 *†E. O. Hanson, *Instr. Dairy Husb.; Asst. Dairy Husb.*
 †Charles Haralson, *(Excelsior), Supt. Fruit Farm*
 *Lillian Harrison, *Instr. Dom. Art.*
 *†E. C. Higbie, A. B. in Ed., A. M., *Supt. West Cent. Sch. Agr., Morris; Supt. Morris Substa.*
 *†H. P. Hoskins, D. V. M., *(Asst.) Vet. Med.; Asst. Vet.*
 *A. B. Hostetter, B. S., *Supervisor Co. Agts. (Coop. U. S. D. A.).*
 *†C. W. Howard, B. A., *(Asst.) Ent.; Asst. Ent.*
 *G. F. Howard, *Rural Schs., Ext. Div.*
 *†DeForest Hungerford, B. S., *Instr. Soils; Asst. Agr. Chem.*
 *†T. B. Hutcheson, M. S. in A., *(Assoc.) Plant Brdg.; Assoc. Plant Brdg.*
 *†Francis Jager, *Apiculture.*
 *†E. Louise Jensen, M. A., *Instr. Mycol.; Mycol.*
 †A. D. Johnston, *Asst. Agr. Engin.*
 *Margaret Jones, B. S. in H. E., *(Morris), Instr. Dom. Sci.*
 *Ethel Kadlec, *(Crookston), Instr. Dom. Sci.*
 *†W. H. Kenety, M. S., *Instr. For.; Asst. For.*

¹ On leave.

- *†Cornelia Kennedy, B. A., *Instr. Agr. Chem.; Asst. Agr. Chem.*
 *D. J. Lane, *Instr. Poultry Husb.*
 †M. S. Larson, M. D., *Consult. An. Path.*
 *†T. M. McCall, B. S. in H., (*Crookston*), *Instr. Hort.; Hort.*
 *T. B. McCulloch, *Dem. Farms, Ext. Div.*
 *Louise McDanell, M. A., (*Asst.*) *Foods, Cookery.*
 *Mabel McDowell, *Instr. Dom. Sci.*
 †A. J. McGuire, B. S. A., *Supt. Grand Rapids Substa.*
 *W. A. McKerrow, *Live Stock, Ext. Div.*
 †P. R. McMiller, B. S. in Ch., *Asst. Soils.*
 *Olive B. MacComber, *Instr. Dom. Art.*
 *R. S. Mackintosh, B. Agr., M. S., *Hort., Ext. Div.*
 *†E. W. Major, B. Agr., (*Assoc.*) *An. Nutr.; Assoc. An. Nutr.*
 *†C. H. Matthews, *Instr. Poultry Husb.; Asst. Poultry Husb.*
 *D. D. Mayne, *Indus. Hist., Prin. Sch. Agr., Practicums.*
 †L. D. Miller, *Asst. Agr. Engin.*
 *†P. E. Miller, B. S. in A., (*Morris*), *Instr. Agr.; Agron.*
 *J. S. Montgomery, B. S. in A., (*Asst.*) *An. Husb.*
 *†William Moore, B. A., (*Asst.*) *Ent.; Asst. Ent.*
 *Martha B. Moorhead, M. D., *Lect. Dom. Hyg.*
 *Agnes Morton, B. S. in H. E., *Instr. Dom. Sci.*
 *†J. L. Mowry, (*Asst.*) *Agr. Engin.; Asst. Agr. Engin.*
 *Mabel H. Olson, (*Crookston*), *Instr. Dom. Sci.*
 *P. J. Olson, M. S., (*Asst.*) *Agron.*
 *†W. L. Oswald, (*Asst.*) *Agr. Bot.; Asst. Bot., Plant Path.*
 *†C. C. Palmer, D. V. M., *Instr. Vet. Med.; Asst. Vet.*
 *†T. G. Paterson, B. S. in A., (*Asst.*) *An. Husb.; Asst. An. Husb.*
 *†F. W. Peck, B. S. in A., (*Asst.*) *Farm Mgt.; Asst. Farm Mgt.*
 *†J. O. Rankin, B. S. A., M. A., *Editor.*
 *†M. H. Reynolds, B. S., D. V. M., M. D., *Vet. Med., Surg.*
 †H. B. Roe, B. S., *Asst. Agr. Engin.*
 †C. O. Rost, M. A., *Asst. Soils.*
 *Bess Rowe, B. S. in H. E., *Home Econ., Ext. Div.*
 *†A. G. Ruggles, M. A., (*Asst.*) *Ent.; Asst. Ent.*
 *†F. H. Sargent, B. S. in A., (*Crookston*), *Instr. Dairy Husb.; Dairy Husb.*
 *†C. G. Selvig, B. A., *Supt. N. W. Sch. Agr., Crookston; Supt. Crookston Substa.*
 *†Harriet W. Sewall, B. A., *Libr.*
 *Juniata L. Shepperd, M. A., (*Asst.*) *Dom. Sci.*
 *†A. C. Smith, B. S., *Poultry Husb.*
 *Greta E. Smith, *Instr. Textiles.*
 *†H. R. Smith, B. S., *An. Husb.*
 *†E. C. Stakman, Ph. D., (*Asst.*) *Plant Path.; Asst. Plant Path., Bact.*
 *†J. T. Stewart, C. E., *Agr. Engin.*
 *A. V. Storm, Ph. B., M. A., *Agr. Ed.*
 *†R. W. Thatcher, M. A., *Agr. Chem.*
 †M. J. Thompson, B. S. A., *Supt. N. E. Dem. Farm and Substa., Duluth.*
 †A. G. Tolaas, M. S., *Asst. Plant Path.*
 *Mabel B. Trilling, *Instr. Textiles.*
 †G. W. Walker, B. S., *Research Chem. in Soils.*
 *†K. F. Warner, B. A., *Instr. An. Husb.; Asst. An. Husb.*
 *†F. L. Washburn, M. A., *Ent.*
 *†R. M. Washburn, M. S. A., (*Assoc.*) *Dairy Husb.; Assoc. Dairy Husb.*
 *C. H. Welch, *Sec. Farmers' Insts.*
 *†L. D. H. Weld, Ph. D., (*Assoc.*) *Agr. Econ.; Agr. Econ.*
 *†Richard Wellington, M. A., (*Asst.*) *Pomol.; Pomol.*
 *†J. P. Wentling, M. A., (*Assoc.*) *For.; Assoc. For.*
 *†R. M. West, B. S., (*Asst.*) *Agr. Chem.; Asst. Agr. Chem.*
 †H. B. White, B. S. in A., *Asst. Farm. Mech.*
 †L. R. Whitson, E. M., *Asst. Agr. Engin.*
 *Susan Wilder, B. S. in H. E., (*Morris*), *Instr. Dom. Art.*
 *†J. J. Willaman, B. S., *Instr. Agr. Chem.; Asst. Agr. Chem.*
 *†L. E. Wiley, D. V. M., *Instr. Vet. Sci.; Asst. Vet. Sci.*
 *Grace I. Williams, B. S., *Instr. Foods, Cookery.*
 †Warren Williamson, M. A., *Asst. Ent.*
 *†Alva Wilson, M. D., (*Morris*), *Instr. An. Husb.; An. Husb.*
 *A. D. Wilson, B. S. in A., *Dir. Agr. Ext. and Farmers' Insts.*
 *†Robert Wilson, B. S., *Instr. For.; Asst. For.*
 *Arthur Woodman, B. S. in C. E., (*Morris*), *Instr. Agr. Engin.*
 *G. A. Works,¹ M. A., (*Asst.*) *Agr. Ed.*

MISSISSIPPI.

Mississippi Agricultural and Mechanical College and Agricultural Experiment Station, *Agricultural College; the Delta Branch Station, Stoneville; the Holly Springs Branch Station, Holly Springs; and McNeill Branch Station, McNeill.*

*College faculty. †Station staff.

*G. R. Hightower, B. S., *President.*

†E. R. Lloyd, M. S., *Dir. Stations. An. Husb. (†)*

- †C. T. Ames, B. S., *Asst. Dir. Holly Springs Sta.*
 *†J. M. Beal, M. S., (*Asst.*) *Bot.; Asst. Bot.*
 *†C. F. Briscoe, Ph. D., *Bact.*
 *†T. J. Brooks, *Markets, Rural Econ.*
 *†H. B. Brown, Ph. D., *Bot., For.; Bot.*
 *I. W. Carpenter, B. S., (*Asst.*) *Ext. Work.*
 *C. A. Cobb, B. S., *Dir. Ext. Work and Boys' Corn Clubs.*
 *Hugh Critz, B. S., (*Assoc.*) *Agron., Supt. Short Courses.*
 *T. W. Davis, *Libr.*
 *†E. C. Ewing, M. S., *Cotton Specialist Plant; Brdg.*
 †E. B. Ferris, B. S., *Asst. Dir. McNeill Sta.*
 *F. J. Gray, *Instr. Chem.*
 *E. P. Gulleddge, B. S., *Instr. Dairy Husb.*
 *C. B. Haddon, B. S., (*Assoc.*) *An. Husb.*
 *†W. F. Hand, Ph. D., *Chem. (State Chem.).*
 *H. H. Harned, B. S., *Instr. Bact.*
 *†R. W. Harned, B. S. A., *Zool.; Ent. (State Ent.).*
 *C. J. Hayden, B. S., *Instr. Hort.*

¹ To go to Cornell University July 1, 1914.

- †W. J. Jennings, *Treas.*
†J. C. Kean, *Supt. Live Stock.*
*†R. N. Lobdell, M. S., (*Asst.*) *Zool.; Asst. Ent.*
*†W. N. Logan, Ph. D., *Geol.*
†D. W. Mellwain, *Farm Supt.*
*†A. B. McKay, M. S., *Hort.*
*J. F. McKay, B. S., *Asst. Dir. Ext. Work.*
*H. D. McMurtry, B. S., (*Asst.*) *Phys.*
*B. J. Marshall, B. S., M. D., *Anat., Physiol.*
*J. E. Mastin, M. S., *Chem. in charge Pure Food Lab.*
*†J. S. Moore, M. S., *Dairy Husb.*
*J. C. Olsen, *Instr. Agr. Engin.*
*R. H. Pate, B. S., *Dir. Farmers' Insts.*
*L. L. Patterson, A. M., M. E., *Phys.*
†W. P. Pevy, (*Stoneville*), *Farm Foreman.*
- †J. E. Phares, (*McNeill*), *Farm Foreman.*
*†E. M. Ranck, V. M. D., *Vet. Med.; Vet. (State Vet.).*
*†J. R. Ricks, M. S., *Agron.*
*Louis Roark, *Instr. Geol.*
*J. C. Robert, V. M. D., Ph. G., M. D., *Dir. Sch. Agr. Agron.*
†J. C. Ryan, (*Holly Springs*), *Farm Foreman.*
*†Daniels Scoates, B. S. C. E., *Agr. Engin.*
*†Archibald Smith, B. S., *An. Husb.; Beef Cattle Work.*
*H. J. Smith, B. S., (*Assoc.*) *Chem.*
*H. C. Steele, *Instr. Chem.*
*B. M. Walker, Ph. D., *V. Pres.*
†G. B. Walker, B. S., (*Stoneville*), *Asst. Dir. Delta Sta.*
*J. T. West, B. S., *Instr. Agron.*

Alcorn Agricultural and Mechanical College, Alcorn.

*College faculty.

*J. A. Martin, B. S., *President.*

- *P. S. Bowles, B. S., (*Asst.*) *Agr.*
*R. A. Gordon, B. S., M. D., *Phys., Chem.*
*Alice G. Laws, *Instr. Sewing.*
*Mrs. Sadie H. Miller, *Instr. Home Econ.*
- *F. J. Norwood, B. S., *Agr., Farm Supt.*
*A. E. Perkins, B. S., *Biol.*
*Anna C. Snodgrass, *Supt. Laundry.*
*H. T. Tanner, *Hort.*

MISSOURI.

College of Agriculture and the Agricultural Experiment Station of the University of Missouri, Columbia.

*College faculty. †Station staff.

- *A. R. Hill, Ph. D., LL. D., *President of University.*
*†F. B. Mumford, M. S., *Dean Coll. Agr. Dir. Sta. An. Husb. (**) In charge of Ext. Work.*
- *†H. O. Allison, M. S. (*Assoc.*) *An. Husb.; An. Husb.*
*†J. G. Babb, LL. B., M. A., *Sec.*
*†L. S. Backus, D. V. M., (*Asst.*) *Vet. Sci.; Vet.*
*J. P. Bennett, A. B., *Asst. Bot.*
*†F. L. Bentley, B. S., *Asst. Agron.*
*†R. S. Besse, B. S., *Asst. Farm Mgt.*
*†Harriet Bixby, *Libr.*
*†P. M. Brandt, M. A., *Instr. Dairy Husb.; Asst. Dairy Husb.*
*E. B. Branson, Ph. D., *Geol.*
*W. G. Brown, Ph. D., *Tech. Chem.*
*Sidney Calvert, A. M., *Org. Chem.*
*Nelle Carter, B. S., *Asst. Home Econ.*
*L. F. Childers, A. M., (*Asst.*) *Agron., Ext. Work.*
*†J. W. Connaway, D. V. S., M. D., *Vet. and Comp. Med.; Vet.*
*W. C. Curtis, Ph. D., *Zool.*
*Amy L. Daniels, Ph. D., (*Asst.*) *Home Econ.*
*L. V. Davis, B. S., *Asst. Soil Survey.*
*†D. H. Doane, M. S., *Farm Mgt.*
*†T. R. Douglass, B. S., (*Asst.*) *Agron.; Agron.*
*†Frederick Dunlap, F. E., *For.*
*E. J. Durand, D. Sc., (*Assoc.*) *Bot.*
*†C. H. Eckles, M. S., *Dairy Husb.*
*R. H. Emberson, B. S., *Rural Ed.*
*†A. R. Evans, B. S., *Asst. Agron.*
*†P. L. Gainey, M. S., *Instr. Bot.; Asst. Bot.*
*J. A. Gibson, M. A., (*Asst.*) *Chem.*
*†J. B. Gingery, D. V. M., (*Asst.*) *Vet. Sci.; Vet.*
- *S. D. Gromer, A. M., (*Asst.*) *Rural Econ.*
*†Howard Hackedorn, B. S., (*Asst.*) *An. Husb.; Asst. An. Husb.*
*†J. C. Hackleman, M. A., (*Asst.*) *Agron.; Agron.*
*†L. D. Haigh, Ph. D., *Asst. Agr. Chem.*
*†Leonard Haseman, Ph. D., (*Asst.*) *Ent.; Ent.*
*†W. L. Howard, Ph. D., *Hort.*
*†R. R. Hudelson, B. S., *Instr. Agron.; Asst. Agron.*
*†E. H. Hughes, B. S., *Asst. An. Husb.*
*†C. B. Hutchison, M. S., *Agron.; Asst. Agron.*
*†O. R. Johnson, M. A., (*Asst.*) *Farm Mgt.; Farm Mgt.*
*†M. A. R. Kelley, B. S. (M. E., A. E.), *Asst. Agron.*
*†H. L. Kempster, B. S., (*Assoc.*) *Poultry Husb.; Poultry Husb.*
*†E. W. Knobel, B. S., *Asst. Soil Survey.*
*†H. H. Krusekopf, B. S., *Asst. Soil Survey.*
*†C. A. LeClair, M. A., *Instr. Agron.; Asst. Agron.*
*George Lefevre, Ph. D., *Zool.*
*†H. F. Major, B. S., (*Asst.*) *Landsc. Gard.; Landsc. Gard.*
*†A. J. Meyer, (*Assoc.*) *Short Courses, Asst. to Dean and Dir.*
*†M. F. Miller, M. S. A., *Agron.*
*†C. R. Moulton, Ph. D., (*Asst.*) *Agr. Chem.; Agr. Chem.*
*†L. S. Palmer, Ch. E., Ph. D., (*Asst.*) *Dairy Chem.; Dairy Chem.*

*†E. C. Pegg, M. F., *Instr. For.; Asst. For.*
 *†R. B. Price, M. S., *Treas.*
 *†G. M. Reed, Ph. D., *Bot.*
 *†T. C. Reed, B. S., *Asst. Dairy Husb.*
 *†George Reeder, *Lect. Met., Climat. Section Dir., U. S. Weather Bureau.*
 *†W. M. Regan, B. S., *Asst. Dairy Husb.*
 *†L. G. Rinkle, M. S., (*Asst.*) *Dairy Husb.; Dairy Husb.*
 *†Helman Rosenthal, A. B., *Asst. Agr. Chem.*
 *Herman Schlundt, Ph. D., *Phys. Chem.*
 *†S. T. Simpson, B. S., *Instr. An. Husb.; Asst. An. Husb.*
 *†O. C. Smith, A. B., *Asst. Agr. Chem.*
 *Minnie Sneekings, B. S., *Asst. Bot.*

*†E. R. Spence, B. S., *Asst. Vet. Sci.*
 *Louise Stanley, Ph. D., (*Asst.*) *Home Econ.*
 *†Boleslaus Szymoniak, B. S., *Asst. Hort.*
 *†T. J. Talbert, B. S., *Asst. Ent.*
 *†E. A. Trowbridge, B. S., *An. Husb.*
 *†P. F. Trowbridge, Ph. D., *Agr. Chem.*
 *†T. T. Tucker, B. S., *Asst. Vet. Sci.*
 *†E. E. Vanatta, M. S., *Asst. Agr. Chem.*
 *†W. I. Watkins, B. S., *Asst. Soil Survey.*
 *†L. A. Weaver, B. S., (*Asst.*) *An. Husb.; Asst. An. Husb.*
 *†C. A. Webster, B. S., *Asst. Poultry Husb.*
 *†J. C. Whitten, Ph. D., *Hort.*
 *†C. C. Wiggins, A. M., *Asst. Hort.*

Missouri State Fruit Experiment Station, Mountain Grove.

†Station staff.

†Paul Evans, *Dir.*

†D. H. Rose, A. M., *Path.*
 †M. P. Somes, M. S., *Ent.*

†A. M. Swartwout, *Asst. Hort.*
 †C. M. Williams, (*Cuba*), *Field Hort.*

Lincoln Institute, Jefferson City.

*College faculty.

*B. F. Allen, A. M., LL.D., *President.*

*B. F. Bullock, B. S., *Chem., Agr.*
 *Mrs. R. C. Caldwell, B. S. D., *Dom. Sci.*
 *J. W. Damel, M. Ph., *Phys., Biol.*
 *Mrs. S. W. Dixon, *Laundry.*
 *T. M. Hampton, *Farm Mgt., Market Gard.*

*Nora L. Hingston, B. S. D., *Dom. Art.*
 *J. G. Lumpkin, *Asst. Agr., Dairying, Farm Mgt.*
 *Lula Shelby, B. S., *Dom. Art.*
 *Hattie B. Sprague, *Nature Study.*
 *Gertrude Williams, *Libr.*

MONTANA.

Montana State College of Agriculture and Mechanic Arts and the Agricultural Experiment Station, Bozeman.

*College faculty. †Station staff.

*J. M. Hamilton, M. S., *President.*

*†F. B. Linfield, B. S. A., *Dean Coll. Dir. Sta. Agr. (*)*

*†Alfred Atkinson, M. S., *Agron.*
 *Florence Ballinger, (*Asst.*) *Dom. Art.*
 *R. A. Barnes, B. S., (*Asst.*) *Chem.*
 †Edmund Burke, B. S., *Chem.*
 *W. M. Cobleigh, A. M., *Chem. (State Chem.).*
 *G. H. Cook, B. S., *Agron. Specialist, Ext. Div.*
 *F. S. Cooley, B. S., *Dir. Ext. Work.*
 *†R. A. Cooley, B. S., *Ent. (State Ent.).*
 †E. L. Currier, B. S., *Asst. in Farm Mgt.*
 *†P. N. Flint, M. S., *An. Husb.*
 †L. F. Gieseke, B. S., *Asst. Agron.*
 *F. W. Ham, M. S., *Phys.*
 *Lilla A. Harkins, M. S., *Dom. Sci.*
 *W. J. Hartman, B. S. A., *Live Stock Specialist, Ext. Div.*
 *Ada E. Hunt, A. B., *Instr. Home Econ.*
 *H. M. Jennison, M. A., (*Asst.*) *Bot., Bact.*
 *G. L. Martin, B. S. A., (*Asst.*) *An. Husb.*
 †R. F. Miller, M. S., *Asst. An. Husb.*
 †J. G. Morgan, B. S., *Asst. in Grain Lab.*

†H. E. Morris, B. S., *Asst. Bot., Bact.*
 †J. B. Nelson, *Supt. Dry Farm Work.*
 †J. R. Parker, B. S., *Asst. Ent.*
 †C. H. Peterson, (*Lewiston*), *Agr. Agt.*
 †R. M. Pinckney, M. A., *Asst. Chem.*
 †E. J. Quinn, B. S., *Asst. Chem.*
 *†L. G. Schermerhorn, B. S., (*Asst.*) *Hort.; Asst. Hort.*
 *†W. F. Schoppe, M. S., (*Asst.*) *Poultry Husb.; Asst. Poultryman.*
 †G. E. Smith, *Asst. Chem.*
 *M. H. Spaulding, A. M., (*Asst.*) *Zool.*
 *†D. B. Swingle, M. S., *Bot., Bact.*
 *†Howard Welch, B. S., D. V. M., *Vet. Sci.; Vet.*
 *†O. B. Whipple, B. S., *Hort.*
 *W. O. Whitcomb, M. S., (*Asst.*) *Agron.*
 †B. W. Whitlock, B. S., *in charge Grain Lab.*
 †M. L. Wilson, B. S., *Agr. Agt.*
 *Mary K. Winter, *Libr.*

1 On leave.

NEBRASKA.

College of Agriculture and the Agricultural Experiment Station of the University of Nebraska, Lincoln.

*College faculty. †Station staff.

*Samuel Avery, Ph.D., LL.D., *Chancellor of University.**†E. A. Burnett, ¹B. S., *Dean Coll. Agr. Dir. Sta.**S. W. Alford, D. V. S., *Asst. in Serum Prod.**A. A. Baer, B. A., (*Adj.*) *Agr. Engin.*†E. H. Barbour, Ph. D., *Geol.**†P. B. Barker, M. A., *Instructional Agron.; Assoc. Agron.**N. A. Bengtson, A. M., (*Asst.*) *Agr. Indus. and Soil Survey.**C. E. Bessey, Ph. D., LL. D., *Head Bot.**†R. K. Bliss, B. S. A., *An. Husb.**E. E. Brackett, B. S., *Instr. Agr. Engin.**H. E. Bradford, A. B., *Secon. Agr. Ed., Prin. Sch. Agr.**Mary E. Brown, B. S., *Instr. Home Econ.**†Lawrence Bruner, B. S., *Head Ent. (State Ent.).**†J. W. Calvin, B. S., (*Asst.*) *Agr. Chem.; Asst. Chem.**†L. W. Chase, B. S. M. E., *Head Agr. Engin.*†G. R. Chatburn, A. M., *Highway Engin.**N. T. Childs, M. F., *Instr. For.**G. E. Condra, Ph. D., *Agr. Indus. and Soil Survey.**†J. R. Cooper, B. S., (*Asst.*) *Hort.; Asst. Hort.*†James Cowan, M. E., *Supt. Valentine Substa.*†J. S. Dales, M. Ph., *Financial Sec.**Helen L. Davis, B. S., (*Adj.*) *Home Econ.**†F. C. Dean, A. B., *Agr. Editor.**†R. A. Emerson, D. Sc., *Hort.**†H. C. Filley, A. M., *Farm Mgt.**†J. H. Frandsen, M. S. A., *Head Dairy Husb.**†J. H. Gain, M. D. C., *An. Path.**L. M. Gates, *Field Expert in Ent.**A. G. George, B. S., *Lab. Asst. in Agron.**†H. J. Gramlich, B. S., (*Assoc.*) *An. Husb., Asst. Supt. Ext.; Asst. An. Husb.**Jessie Greene, B. S., *Instr. Home Econ.*†C. A. Helm, B. S., *Asst. Expt. Agron.**G. W. Heod, B. S., (*Assoc.*) *Hort.**†Erwin Hopt, B. S., (*Asst.*) *Agron.; Asst. Agron.**R. C. Jensen, A. M., *Instr. Dairy Husb.**Fred Johnson, B. S., D. V. S., *Supt. Serum Plant.**†T. A. Kiesselbach, A. M., *Expt. Agron.*†Fritz Knorr, B. S., *Supt. Scottsbluff Substa. Mitchell.**†C. B. Lee, A. M., (*Assoc.*) *An. Husb.; Asst. An. Husb.**†G. K. K. Link, A. M., *Agr. Bot.; Asst. Agr. Bot.**Alice M. Loomis, M. A., *Home Econ.**†G. A. Loveland, M. A., LL. B., *Met.*†H. A. McComb, B. S., *Asst. Hort., North Platte Substa.**Florence A. McCormick, M. S., (*Adj.*) *Agr. Bot.**Samuel McKelvie, *Lect. Swine Judging.**Berna A. Miskell, B. S., *Instr. Home Econ.**R. L. Moore, *Instr. Agr. Engin.**†W. J. Morrill, M. F., *For.*†H. L. Nye, *Foreman Dem. Farm, Culbertson.**Edith V. Ohlsen, B. S., *Instr. Home Econ.**Anna M. Olsen, B. S., (*Adj.*) *Home Econ.*†S. W. Perin, *Farm Supt.**H. M. Plum, M. S., (*Asst.*) *Agr. Chem.**†C. W. Pugsley, B. S., *Dir. Ext. Service.*†J. A. Ratcliff, B. S., *Asst. Expt. Agron.**Hester M. Rusk, A. B., *Instr. Agr. Bot.**L. F. Seaton, B. S. M. E., (*Asst.*) *Agr. Engin.**Rose A. Shonka, *Instr. Home Econ.**C. W. Smith, *Instr. Phys.*†W. P. Snyder, M. S., *Supt. North Platte Substa.*†O. V. P. Stout, C. E., *Irrig. Engin.**†L. B. Sturdevant, A. M., M. D., (*Asst.*) *An. Path. Asst. An. Path.**†M. H. Swenk, A. M., (*Assoc.*) *Ent.; Assoc. Ent.**J. L. Thomas, B. S., *Lab. Asst. in Agron.**†F. W. Upson, Ph. D., *Agr. Chem.**H. E. Vasey, B. S., *Lab. Asst. in Agr. Bot.**†E. M. Wilcox, Ph. D., *Head Agr. Bot.**Maud M. Wilson, B. S., *Instr. Home Econ.**I. D. Wood, M. A., *Instr. Agr. Engin.**†E. G. Woodward, A. M., (*Adj.*) *Dairy Husb.; Asst. Dairy Husb.**H. J. Young, B. S., (*Asst.*) *Instructional Agron.*

NEVADA.

College of Agriculture and the Agricultural Experiment Station of the University of Nevada, Reno.

*College faculty. †Station staff.

Robert Lewers, *Acting President of University.**†S. B. Doten, M. A., *Dir. Sta. Ent. (*†)**†Maxwell Adams,² Ph. D., *Chem.; Consult. Chem.**Kate Bardenwerper, B. S., (*Asst.*) *Home Econ.*†J. E. Church, jr., Ph. D., *Met.*†T. W. Clark, *Farm Supt.*†Mrs. T. W. Cowgill, M. A., *Libr.*†S. C. Dinsmore, B. S., *Comr. Pure Food and Drug Work.**†S. P. Fergusson, *Met., Climat.; Assoc. Met.**†Peter Frandsen, A. M., *Biol.; Consult. Biol.*†August Holmes, B. A., *Asst. Chem.**†C. A. Jacobson, Ph. D., *Agr. Chem.*†M. B. Kennedy, B. A., *Asst. Comr. Pure Food and Drug Work.**†C. S. Knight, B. S., *Agron.**J. D. Layman, B. L., *Libr.**Margaret Mack, *Asst. Biol.**†W. B. Mack, D. V. M., *Bact., Vet. Sci.**†S. E. Ross, B. S., (*Asst.*) *Soil Chem.; Soil Analyst.**†V. E. Scott, B. S., *Instr. Dairy Husb.; Consult. Dairy Husb.**E. E. Williams, B. S., *Asst. Chem.*¹ In full charge of all substas.² On leave.

NEW HAMPSHIRE.

New Hampshire College of Agriculture and the Mechanic Arts, and the Agricultural Experiment Station, Durham.

*College faculty. †Station staff.

*E. T. Fairchild, D. Pd., LL. D., *President*.†J. C. Kendall, B. S., *Dir. Sta. Dir. Ext. Work*.*†Frank App,¹ B. S., (*Asst.*) *Agron.*; *Asst. Agron.**C. H. Batchelder, B. S., *Asst. Zool.**†Caroline A. Black, Ph. D., (*Asst.*) *Bot.*; *Asst. Bot.**†O. R. Butler, Ph. D., *Bot.*†B. E. Curry,² A. B., *Chem.**O. L. Eckman, B. S., *An. Husb.**W. J. Fisher, Ph. D., *Phys.**†J. H. Foster,² M. F., *For.**†J. H. Gourley,² B. S., *Hort.**†C. H. Hadley, jr.,² B. S., *Asst. Econ. Ent.*; *Asst. Ent.**†Mabel Hodgkins, B. S., *Libr.**H. C. Holden, B. S., *Asst. Chem.**C. F. Jackson, M. A., *Zool.*, *Ent.**Charles James, F. I. C., *Chem.**†J. M. Jones,² M. S., *Instr. An. Husb.*; *An. Husb.**S. H. Katz, B. S. Ch. E., *Instr. Chem.*†Elizabeth E. Mehafe, *Asst. Libr.**R. V. Mitchell, B. S., (*Asst.*) *An. Husb.**†W. C. O'Kane,² M. A., *Econ. Ent.*; *Ent.**H. H. Palmer, B. S., *Instr. Phys.**G. A. Perley, M. S., (*Asst.*) *Phys. Chem.**C. H. Pettee, C. E., LL. D., *Dean*.*J. H. Pierpont, *Asst. in Dairying*.*†Fred Rasmussen,² B. S. A., *Dairying*.†T. O. Smith, A. B., *Asst. Chem.**†W. E. Stokes, M. S., (*Asst.*) *Agron.*; *Asst. Agron.*†C. W. Stone,² A. M., *V. Dir.*, *Farmer*.*†F. W. Taylor,² B. S., *Agron.**M. E. Templeton, B. A., *Asst. Bot.**Helen B. Thompson, M. S., *Home Econ.**W. R. Wilson, B. S., *Instr. Dairying*.*†W. H. Wolff,² M. S., (*Asst.*) *Pomol.*; *Asst. Hort.*

NEW JERSEY.

The New Jersey College for the Benefit of Agriculture and the Mechanic Arts, and the Agricultural Experiment Station of Rutgers Scientific School, New Brunswick.

*College faculty. †Station staff.

*W. H. S. Demarest, A. M., D. D., LL. D., *President*.*†J. G. Lipman, Ph. D., *Dir. Sta. Soil Fert.*, *Bact. (*)*; *Soil Chem.*, *Bact. (†)**Alva Agee, M. S., *Soil Fert.**†A. W. Blair, A. M., (*Assoc.*) *Agr. Chem.*; *Assoc. Soil Chem.*, *Bact.**M. A. Blake, B. S., *Hort.**J. V. Bissett, B. S., *Asst. Chem.**F. E. Chidester, Ph. D., (*Asst.*) *Biol.**†M. T. Cook, Ph. D., *Plant Path.*†J. V. Croot, *Field Asst. in Soils*.*A. C. de Regt, M. S., (*Assoc.*) *Chem.*†B. H. A. Groth, Ph. D., *Plant Physiol.*†Mathilde Groth, *Lab. Aid.**A. M. Hageman, B. S., *Asst. Chem.**†B. D. Halsted, D. Sc., *Bot.**†T. J. Headlee, Ph. D., *Ent.* (*State Ent.*).*J. P. Helyar, M. S., *Instr. Bot.**H. R. Lewis, B. S., (*Asst.*) *Poultry Husb.**J. V. Lewis, B. S., *Geol.*†H. C. McLean, B. S., *Asst. Soil Chem.**†G. W. Martin, Litt. B., *Asst. Bot.*; *Asst. Plant Path.**F. C. Minkler, B. S., (*Assoc.*) *An. Husb.**†Julius Nelson, Ph. D., *Biol.**H. B. North, D. Sc., (*Assoc.*) *Chem.**G. A. Osborn, B. S., *Libr.*†E. J. Owen, M. S., *Asst. Bot.*†Miss M. T. Pleasants, A. B., *Asst. Plant Brgd.**F. R. Pratt, M. S., (*Asst.*) *Phys.**A. C. Ragsdale, *Asst. An. Husb.*†C. H. Richardson, jr., M. S., *Asst. Ent.**R. O. Smith, Ph. D., (*Assoc.*) *Chem.**E. C. Stillwell, B. S., *Instr. Hort.*†I. S. Upson, M. A., *Chief Clerk*.*F. C. Van Dyck, Ph. D., D. Sc., *Phys.**R. G. Wright, Ph. D., *Chem.*

New Jersey State Agricultural Experiment Station, New Brunswick.

†Station staff.

†J. G. Lipman, Ph. D., *Dir. Sta.*†Alva Agee, M. S., *Chief Ext. Dept.*†M. A. Blake, B. S., *Hort.*†C. S. Cathcart, M. S., *Chem.*†A. L. Clark, *Asst. Poultry Husb.*, *Ext. Dept.*†C. H. Connors, B. S., *Asst. Expt. Hort.*†A. S. Cook, *Dairy Husb.*†W. A. Cray, *Fert. and Feed Sampler*.†A. J. Farley, B. S., *Assoc. Hort.*, *Ext. Dept.*†A. L. Hagen, B. S., *Herdsmen*.†T. J. Headlee, Ph. D., *Ent.* (*State Ent.*).†J. P. Helyar, M. S., *Seed Analyst*.†D. M. Jobbins, *Greenhouse Asst.*†H. R. Lewis, B. S., *Poultry Husb.*†F. C. Minkler, B. S. A., *An. Husb.*†J. S. Obecný, B. S., *Field Asst.*, *Mosquito Invest.*†W. W. Oley, B. S., *Field Asst. Hort.*†I. L. Owen, *Asst. Agron.*†W. H. Pearson, *Asst. Chem.*†W. C. Pelton, B. S., *Asst. Market Gard.*, *Ext. Dept.*†L. A. Ruzicka, *Greenhouse Asst.*†Wm. Schieferstein, *Field Asst. Hort.*†Robert Schmidt, B. S., *Asst. Seed Analyst*.†Morris Siegel, *Asst. Poultry Husb.*†W. C. Thompson, B. S., *Expt. Poultry Husb.*†I. S. Upson, M. A., *Sec.*, *Treas.*†J. H. Voorhees, B. S., *Asst. Agron.*, *Ext. Dept.*†A. C. Wark, *Lab. Asst.*†E. H. Wene, *Asst. Poultry Husb.*†J. J. Williams, *Microscopist*.†R. L. Willis, B. S., *Asst. Chem.*¹ On leave.² Also engaged in Extension Work.

NEW MEXICO.

New Mexico College of Agriculture and Mechanic Arts, and the Agricultural Experiment Station, State College (freight and express address, Mesilla Park).

*College faculty. †Station staff.

*G. E. Ladd, Ph. D., *President. Geol.*

*†Fabian Garcia, M. S. A., *Dir. Sta. Hort. (*†)*

†Edna E. Anderson, *Asst. Libr.*

*†J. A. Anderson, B. S., *Editor.*

*†F. L. Bixby, B. S. C. E., *Irrig. Engin.*

*†D. W. Bloodgood, B. S. M. E., *Asst. Irrig. Engin.*

*†F. W. Christensen, M. S., (*Assoc.*) *Chem.; An. Nutr.*

*W. T. Conway, B. S., *Supt. Agr. Ext., (Asst.) Agron.*

*†W. S. Cunningham, B. S., *Asst. An. Husb., Dairying.*

*†Luther Foster, M. S. A., *Agr.; in charge An. Husb. Dept.*

*†H. S. Hammond, M. A., *Biol.; Bot.*

*†R. F. Hare, Ph. D., *Chem., V. Dir. Sta.*

*†Roland Harwell, *Asst. Agron.*

*†E. P. Humbert, Ph. D., *Agron.*

*†George Kable, B. S., *Asst. Irrig. Engin.*

*†L. R. McNeely, B. S., *Asst. Agron.*

*†D. E. Merrill, M. S., (*Asst.*) *Biol.; Asst. Ent.*

*Pearl C. Miller, B. S., *Household Econ.*

*†Josephine Morton, A. B., *Libr.*

*†J. R. Quesenberry, B. S., *Asst. An. Husb.*

†José Quintero, B. S., *Asst. Chem.*

*†J. W. Rigney, B. S. A., (*Asst.*) *Hort.; Asst. Hort.*

*Frank Stockton, B. S., *Phys.*

*Ruth Thompson, B. S., *Asst. Household Econ.*

NEW YORK.

New York State College of Agriculture at Cornell University and the Agricultural Experiment Station, Ithaca.

*College faculty. †Station staff.

*J. G. Schurman, D. Sc., LL.D., *President of University.*

*†W. A. Stocking, jr., M. S. A., *Actg. Dir. Coll. and Sta. Dairy Indus. (*)*

*C. P. Alexander, B. S., *Asst. Ent.*

*L. W. Arny, B. S., *Instr. Pomol.*

*Anna M. Atwater, *Asst. Plant Brdg.*

*†H. L. Ayres, *Ext. Instr. Dairy Indus.; Supt. Dairy Mfrs.*

*E. E. Barker, A. B., *Instr. Plant Brdg.*

*†M. F. Barrus, Ph. D., *Ext. Teaching Plant Path.; Plant Path.*

*†A. C. Beal, Ph. D., *Invest. and Expt. Flor.*

*E. W. Benjamin, M. S. A., *Instr. Poultry Husb.*

*†John Bentley, jr., M. F., (*Asst.*) *For.; For.*

*A. M. Besemer, B. S., *Asst. Dairy Bact.*

*†J. A. Bizzell, Ph. D., *Soil Tech.*

*J. C. Bradley, Ph. D., (*Asst.*) *Systematic Ent.*

*Clara Browning, B. S., *Instr. Home Econ.*

*H. O. Buckman, Ph. D., (*Asst.*) *Soil Tech.*

*M. C. Burritt, M. S. A., *Ext. Teaching and Dir. Farm Bureau (Coop. U. S. D. A.).*

*†G. W. Cavanaugh, B. S., *Chem.*

*W. H. Chandler, M. S., *Pomol. (Research).*

*Charles Chupp, A. B., *Asst. Plant Path.*

*W. A. Clemens, B. A., *Asst. Biol.*

*Mrs. Anna B. Comstock, B. S., (*Asst.*) *Ent., Nature Study.*

*†J. H. Comstock, B. S., *Ent., Zool.*

*H. J. Conlin, *Asst. Agr. Chem.*

*A. F. Coutant, B. S., *Asst. Parasitol.*

*†W. T. Craig, *Asst. Plant Brdg. (Coop. U.S.D.A.).*

*†C. R. Crosby, A. B., *Ext. Ent.; Ent. Invest.*

*L. J. Cross, Ph. D., (*Asst.*) *Agr. Chem.*

*O. F. Curtis, M. S., *Instr. Bot.*

*R. W. Curtis, M. S. A., (*Asst.*) *Landsc. Art.*

*E. G. Davis, B. S., (*Asst.*) *Landsc. Art.*

*T. C. Davis, A. B., *Asst. Bot.*

*C. E. Dimon, B. S., *Instr. Veg. Gard.*

*G. C. Dutton, *Asst. Cheese Making.*

*A. J. Eames, Ph. D., *Instr. Bot.*

*G. C. Embody, Ph. D., (*Asst.*) *Aquiculture.*

*G. A. Everett, A. B., LL.B., (*Asst.*) *Ext. Teaching.*

*†E. O. Fippin, B. S. A., *Soil Tech.*

*W. R. Fischer, *Lab. Asst. in Plant Path.*

*†W. W. Fisk, M. S., (*Asst.*) *Dairy Indus.; Dairy Indus.*

*H. M. Fitzpatrick, Ph. D., (*Asst.*) *Plant Path.*

*Bryant Fleming, B. S. A., *Landsc. Art.*

*D. S. Fox, B. S., *Instr. Farm Mgt.*

*Elizabeth F. Genung, B. S. A., *Asst. Dairy Bact.*

*Ada E. Georgia, *Asst. Ent., Farm Courses.*

*†A. W. Gilbert, Ph. D., *Plant Brdg.*

*Royal Gilkey, B. S. A., *Instr. Ext. Teaching, Supervisor Mailing Div. and Reading Courses.*

*†C. T. Gregory, B. S., *Instr. Plant Path.; Asst. Plant Path.*

†L. G. Gross, *Asst. Editor.*

*†E. S. Guthrie, Ph. D., *Dairy Indus.*

*E. V. Hardenburg, B. S., *Instr. Farm Crops.*

*†M. W. Harper, M. S., *An. Husb.*

*R. J. Haskell, B. S., *Instr. Plant Path.*

*I. M. Hawley, B. A., *Asst. Econ. Ent.*

*L. E. Hazen, B. S., *Instr. Farm Mech.*

*†G. W. Herrick, B. S. A., *Econ. Ent.*

*L. R. Hesler, A. B., *Instr. Plant Path.*

*Mary E. Hill, B. S., *Asst. Biol.*

*H. A. Hopper, M. S., *Ext. Teaching An. Husb.*

*A. C. Hottes, B. S., *Asst. Flor.*

*Anna E. Hunn, B. S., *Mgr. Cafeteria (Home Econ.).*

*C. E. Hunn, *Foreman Grounds.*

*L. M. Hurd, *Asst. Poultry Husb.*

*I. C. Jagger, M. S., *Instr. Plant Path.*

*R. A. Jehle, M. S., *Instr. Plant Path.*

- *O. A. Johannsen, Ph. D., *Ent.*
 *V. R. Jones, B. S., *Asst. Dairy Testing.*
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 *Helen Knowlton, *Instr. Home Econ.*
 *†Lewis Knudson, Ph. D., (*Asst.*) *Plant Physiol.; Plant Physiol.*
 *W. G. Krum, *Supt. Poultry Plant.*
 *C. E. Ladd, B. S., *Instr. Farm Mgt. (Coop. U. S. D. A.).*
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 *E. T. Lewis, *Asst. Farm Crops.*
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 *†K. C. Livermore, B. S., *Farm Mgt.*
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 *†H. H. Love, Ph. D., *Plant Brdg.*
 *David Lumsden, (*Asst.*) *Flor.*
 *†T. L. Lyon,¹ Ph. D., *Soil Tech.*
 *W. S. Lyon, *Asst. Poultry Husb.*
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 *C. J. Perry, *Asst. Poultry Husb.*
 *F. W. Pettet, B. A., *Asst. Bot.*
 *†H. M. Pickerell, B. S., *Instr. Dairy Indus.; Asst. Dairy Indus.*
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 *A. B. Recknagel, M. F., M. S., *For.*
 *†Donald Reddick, Ph. D., *Plant Path.*
 *†F. E. Rice, A. B., *Instr. Agr. Chem.; Asst. Agr. Chem.*
 *†J. E. Rice, B. S. A., *Poultry Husb.*
 *E. A. Richmond, B. S., *Asst. Ent.*
 *†H. W. Riley, M. E., *Farm Mech., Rural Engin.*
 *†W. A. Riley, Ph. D., *Insect Morphology, Parasitol., Ent.*
 *B. B. Robb, M. S. A., (*Asst.*) *Rural Engin.*
 *W. J. Robbins, A. B., *Instr. Bot.*
 *I. P. Roberts, M. Agr., *Agr. Emeritus.*
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 *Flora Rose, M. A., *Home Econ.*
 *†H. E. Ross, M. S. A., *Dairy Indus.*
 *†E. S. Savage, Ph. D., *An. Husb.*
 *K. P. Schmidt, *Asst. Ent.*
 *H. W. Schneck, B. S., *Instr. Veg. Gard.*
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 *M. Spiegel, *Gardener.*
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 *†J. L. Stone, B. Agr., *Farm Pract.*
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 *G. C. Supplee, M. S. A., *Instr. Dairy Indus.*
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New York State Agricultural Experiment Station, Geneva.

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 †W. O. Gloyer, M. A., *Assoc. Bot.*

² Assumes duties July 1, 1914.

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 †L. L. Van Slyke, Ph. D., *Chem.*
 †J. W. Wellington, B. S., *Asst. Hort.*
 †W. P. Wheeler, *An. Indus.*

NORTH CAROLINA.

North Carolina College of Agriculture and Mechanic Arts, West Raleigh, and the
 Agricultural Experiment Station, Raleigh and West Raleigh.

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 †R. G. Hill, *Asst. Hort.*
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 †R. C. Journey, *Soil Survey.*
 *L. F. Koonce, B. S., D. V. S., *Instr. Vet. Sci.*
 †H. M. Lynde, *Drainage Engin. (Coop. U. S. D. A.)*.
 †F. N. McDowell, B. S., *Asst. Agron. (Soils)*.
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 *†Mrs. Charles McKimmon, *Asst. Agr. Ext.; Girls' Clubs (Coop. U. S. D. A.)*.
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†F. T. Meacham, *Asst. Dir. Iredell Br. Sta., Statesville.*
 †C. L. Metcalf, *Asst. Ent.*
 *†Z. P. Metcalf, B. A., *Zool., Ent.*
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 (*Coop. U. S. D. A.*).
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 †W. C. Norton, *Asst. Bact.*
 *J. W. Nowell, Ph. D., *Instr. Chem.*
 *†W. F. Pate, M. S., *Instr. Chem.; Agron. (Soils)*.
 †S. O. Perkins, B. S., *Soil Survey.*
 †J. M. Pickel, Ph. D., *Feed Chem.*
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 †J. K. Plummer, M. A., *Soil Chem.*
 *V. C. Pritchett, M. S., *Instr. Phys.*
 †F. S. Puckett, *Asst. Dir., Buncombe and Transylvania Br. Stas., Swannanoa.*
 †A. J. Reed, *Dairy Farming (Coop. U. S. D. A.)*.
 *†G. A. Roberts, B. S., D. V. S., *Vet. Sci., Physiol.; Vet.*
 †A. K. Robertson, B. S., *Asst. Boys' Corn Clubs.*
 *†C. B. Ross, M. S., *Instr. Poultry Husb.; Asst. Poultryman (Coop. U. S. D. A.)*.
 †A. R. Russell, *Asst. Field Expts.*
 *S. M. Salisbury, B. S. A., *Instr. Dairying.*
 †Margaret Scott, *Asst. Girls' Club Work (Coop. U. S. D. A.)*.
 †R. W. Scott, jr., *Asst. Dir., Edgecombe Br. Sta., Rocky Mount.*
 *S. B. Shaw, B. S., *Asst. Hort.*
 †Franklin Sherman, jr., B. S., *Ent.*
 *M. E. Sherwin, M. S., *Soils.*
 *F. B. Sherwood, B. S., *Instr. Chem.*
 †L. W. Shook, M. S., *Asst. Beef and Swine Work.*
 *E. F. Stoddard, B. S., *Instr. Hort.*
 *†T. H. Taylor, *Instr. Poultry Husb.; Actg. Poultryman.*
 †C. B. Williams, M. S., *V. Dir., Agron.*
 *L. F. Williams, Ph. D. (*Asst.*) *Chem.*
 *Mrs. Charlotte M. Williamson, *Libr.*
 †R. Y. Winters, Ph. D., *Agron. (Crops)*.
 *†W. A. Withers, A. M., *Chem.*
 *H. C. Young, B. S., *Instr. Bot., Bact.*

The Agricultural and Mechanical College for the Colored Race, Greensboro.

*College faculty.

*J. B. Dudley, A. M., LL. D., *President.*

*J. H. Bluford, A. M., *Dir. Agr. Dept., Instr. Agr., Chem.*
 *R. H. Hampton, B. S., *Instr. Hort., Bot., Flor.*

*A. L. Mebane, M. Agr., *Supt. Dairy. Instr. Dairy Husb., Bact., Vet. Sci.*
 *F. D. Wharton, B. S. A., *Market Gard., Poultry.*

NORTH DAKOTA.

North Dakota Agricultural College and the Agricultural Experiment Station, Agricultural College (freight and express address, Fargo).

*College faculty. †Station staff.

*J. H. Worst, LL. D., *President.*

†T. P. Cooper, B. S. A., *Dir. Sta. In charge Ext. Work.*

*†W. B. Bell, Ph. D., *Zool., Physiol.; Asst. Biol. (Econ. Survey).*

*†H. L. Bolley, M. S., *Bot., Plant Path.*

*†C. F. Chase, B. S., (*Asst.*) *Agr. Engin.; Asst. Agr. Engin.*

*†Ralph Darner, A. M., (*Asst.*) *Chem.; Asst. Chem. (Oils and Varnishes).*

*†M. L. Dolt, Ph. D., *Org. and Anal. Chem.; Asst. Chem. (Textile Fibers).*

*†R. C. Doneghue, M. S. A., *Agron. (Soils); Soil Invest.*

*†C. J. T. Doryland, M. S., (*Asst.*) *Bact.; Soil Bact.*

*†O. W. Dynes, B. S., (*Assoc.*) *Agron. (Farm Crops); Plant Brdg., Poultry.*

†N. S. Evans, *Asst. Bot. (Seed Anal.).*

†C. T. Guthrie, Ph. C., B. S., *Asst. Chem. (Drugs).*

*Geraldine Hadley, B. S., *Instr. Home Econ.*

†Robert Hulbert, B. S., *Asst. Chem.*

*†J. W. Ince, M. A., *Agr. Chem.; Asst. Chem. (Soils).*

*Katie Jensen, M. S., *Instr. Dom. Sci.*

*E. S. Keene, M. E., *Phys.*

†C. V. Kennedy, *Farm Foreman.*

*†E. F. Ladd, B. S., *Chem. (State Chem.).*

†W. R. Lanxon, *Supt. Substa., Hettinger.*

*Mrs. Ethel McVeety, *Libr.*

†W. H. Mercer, B. S., *Asst. Bot. (Plant Brdg.).*

†D. G. Milbrath, A. B., *Asst. Bot. (Mycol., Histol.).*

*†G. E. Miller, M. A., *Instr. Biol.; Asst. Bot. (Econ. Survey).*

*†Stephen O'Toole, D. V. M., (*Asst.*) *Vet. Sci.; Asst. Vet.*

*W. C. Palmer, M. S., *Agr. Editor, Ext. Div.*

†W. R. Porter, M. S. A., *Supt. Dem. Farms.*

*G. W. Randlett, B. S. A., *Dir. Coll. Ext. and Farmers' Insts.*

*†R. E. Remington, B. A., *Food and Sanitary Chem.; Asst. Food Chem.*

*†E. S. Reynolds, Ph. D., (*Assoc.*) *Bot.; Mycol., Plant Survey.*

*†W. B. Richards, B. S. A., *An. Husb.; Asst. An. Husb.*

†C. H. Ruzicka, *Asst. to Dir.*

†Thomas Sanderson, *Miller.*

*†A. F. Schalk, D. V. M., (*Asst.*) *Vet. Sci.; Asst. Vet.*

*A. F. Schlichting, B. S., *Instr. Materia Medica, Therapeutics.*

†E. G. Schollander, B. S., *Supt. Substa., Williston.*

†Mrs. Adele Shepperd, *Asst. Chem. (Water).*

*†J. H. Shepperd, M. S. A., *Agr.; V. Dir., Agr. (in charge Substas. and Dem. Farms).*

†O. A. Stevens, B. S., *Asst. Bot.; Seed Anal.*

†E. D. Stewart, B. S., *Supt. Substa., Langdon.*

†W. L. Stockham, M. S., *Asst. Chem. (Oils).*

*Minna A. Stoner, B. S., *Home Econ.*

†W. F. Sudro, B. S., *Asst. Chem. (Drugs).*

*Bessie E. Taylor, B. S., *Instr. Dom. Art.*

†Levi Thomas, M. S., *Asst. Chem. (Baking).*

*†E. J. Thompson, B. S., (*Asst.*) *An. Husb.; Asst. An. Husb.*

†O. A. Thompson, B. S., *Supt. Substa., Edgeley.*

*†Leunis Van Es, M. D., V. S., *Vet. Sci.; Vet.*

*C. B. Waldron, B. S., *Hort., For.*

†L. R. Waldron, Ph. D., *Supt. Substa., Dickinson.*

*†W. F. Washburn, M. S., *Indus. Chem.; Asst. Chem. (Paints).*

*†H. O. Werner, B. S., *Instr. Hort.; Asst. Hort.*

*†H. L. White, M. A., *Physiol. Chem., Toxicology; Asst. Chem. (Cereals).*

†W. A. Yoder, *Sec.*

†Adolph Ziefle, Ph. C., B. S., *Asst. Chem. (Drugs).*

OHIO.

The Colleges of Agriculture and of Veterinary Medicine, Ohio State University, Columbus.

*College faculty.

*W. O. Thompson, A. M., D. D., LL. D., *President of University.*

*H. C. Price, M. S. A., *Dean Coll. Agr. Rural Econ.*

*D. S. White, D. V. S., *Dean Coll. Vet. Med. Vet. Med.*

*E. M. Allen, M. D., *Instr. Anat., Physiol.*

*M. A. Bachtell, B. S., *Agr. Chem., Ext. Div.*

*L. P. Bailey, (*Tacoma*) *Dairying, Ext. Div.*

*W. M. Barrows, M. S., (*Asst.*) *Zool., Ent.*

*Mary Betz, B. S., *Home Econ., Ext. Div.*

*A. M. Bleile, M. D., *Anat., Physiol.*

*Anna F. Blohm, B. L., B. S., *Instr. Home Econ.*

*C. E. Board, Ph. D., *Instr. Chem.*

*J. A. Bownocker, D. Sc., *Geol.*

*O. V. Brumley, V. S., *Vet. Surg., Dir. Clinics.*

*W. L. Clevenger, B. S., *Instr. Dairying.*

*A. D. Cole, M. A., *Phys.*

*G. B. Crane, B. S., *Editor, Ext. Div.*

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*J. E. Day, B. A., *Asst. Chem.*

*Frederica Detmers, M. S., *Instr. Bot.*

*E. P. Durrant, M. A., (*Asst.*) *Anat., Physiol.*

*R. F. Earhart, Ph. D., *Phys.*

*Porter Elliott, B. S., (*West Mansfield*) *Agron., Ext. Div.*

*Oscar Erf, B. S., *Dairying.*

*H. E. Eswine, *Asst. in Agr. Ext.*

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 *Maude C. Hathaway, B. S., *Instr. Home Econ.*
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 *T. G. Phillips, M. S., *Instr. Agr. Chem.*
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 *H. C. Ramsower, B. S., *Rural Engin.*
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 *Mrs. Clara S. Rodgers, B. S., *Home Econ., Ext. Div.*
 *Isabel Rogers, B. S., *Asst. Home Econ.*
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 *N. W. Scherer, M. S. (*Asst.*), *For.*
 *E. M. Scott, M. S., (*Asst.*) *Vet. Path.*
 *Helen Scott, B. S., *Home Econ., Ext. Div.*
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 *W. G. Stover, A. M., *Instr. Bot.*
 *Anna R. Van Meter, M. S., (*Asst.*) *Home Econ.*
 *W. A. Verwiebe, *Instr. Geol.*
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 *C. S. Wheeler, B. S., *Asst. in Agr. Ent.*
 *Edna N. White, B. A., *Home Econ.*
 *J. R. Wiley, *Asst. An. Husb.*
 *J. R. Withrow, Ph. D., *Chem.*

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 †F. L. Allen, A. B. (*Burton*), *County Agt.*
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 †J. L. King, *Asst. Ent.*
 †C. W. Knudsen, B. S., *Asst. in Nutr.*
 †W. H. Kramer, *Bursar.*
 †H. D. Lewis, *Mgr. Test Farm, Carpenter.*
 †F. K. Mathis, *Office Asst. Bot.*
 †F. N. Meeker, B. S. (*Hamilton*), *County Agt.*

¹ On leave.

†T. R. Middaugh, *Office Asst. Dairying*.
 †H. P. Miller, D. V. M. (*Ravenna*), *County Agt.*
 †Edward Mohn, *Mgr. Test Farm, Strongsville*.
 †C. W. Montgomery (*Newark*), *Supervisor County Expt. Farms*.
 †L. E. Morgan, M. A., *Asst. in Nutr.*
 †E. C. Morr, *Office Asst. Agron.*
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 †E. L. Nixon, B. S., *Asst. Bot.*
 †C. A. Patton, *Asst. Agron., Climat. Observer*.
 †A. E. Perkins, M. S., *Asst. Dairying*.
 †Harry Ray, *Mgr. County Expt. Farm, Paulding*.
 †E. J. Riggs, B. S., (*Columbus*), *Field Asst. Hort.*
 †C. J. Schollenberger, *Asst. Chem.*
 †Edmund Secrest, B. S., *For.*

†A. D. Selby, B. S., *Bot.*
 †J. W. Smith, (*Columbus*), *Climat. (U. S. D. A.)*.
 †D. E. Snyder, *Office Asst. For.*
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 †J. A. Sutton, *Mgr. Test Farm, Findlay*.
 †A. E. Taylor, B. S., *Asst. For.*
 †Paul Thayer, B. S., *Asst. Hort.*
 †M. C. Thomas (*Troy*), *County Agt.*
 †H. F. Tuttle, M. S., *Asst. Soil Tech.*
 †H. M. Wachter, *Mgr. Test Farm, Germantown*.
 †R. C. Walton, B. S., *Asst. Bot.*
 †F. A. Walton, B. S., *Assoc. Agron.*
 †R. D. Whitmarsh, M. S., *Asst. Ent.*
 †G. C. Williams,¹ *Agron., Assoc. Soil Fert. Invest.*
 †John Woodward, B. S., *Asst. in Soil Survey*.

OKLAHOMA.

Oklahoma Agricultural and Mechanical College and the Agricultural Experiment Station, Stillwater.

*College faculty. †Station staff.

*J. H. Connell, M. S., *President*.*†L. L. Lewis, M. S., D. V. M., *Acting. Dir. Sta. Zool., Vet. Sci. (*)*; *Vet. (†)*.

†R. O. Baird, M. S., *Asst. Chem.*
 *G. W. Barnes, B. S., *Instr. Sch. Agr.*
 *†N. O. Booth, B. Agr., *Hort., Bot.*
 *†C. I. Bray, M. S., (*Assoc.*) *An. Husb.; Asst. An. Husb.*
 *†J. M. Cadwallader, B. S., *Asst. in Dairying*.
 *Susie Cage, *Asst. Dom. Arts*.
 *Harder Chambliss, Ph. D., *Chem.*
 *R. E. Chandler, M. M. E., *Phys.*
 *†O. O. Churchill, B. S., *Dean Agr. Div. Agron.*
 *Edith E. Coffman, B. S., *Asst. Dom. Sci.*
 *Margaret Evans, *Dom. Arts*.
 *W. W. Evans, *Supt. Farm*.
 †C. K. Francis, Ph. D., *Chem.*
 *Elizabeth Fulton, *Dom. Sci.*
 *†E. E. Hall, B. S., *Asst. Agron.*
 *H. R. Hedger, B. S., *Asst. Boys' and Girls' Club Work*.
 *V. T. Jackson, A. B., *Asst. Chem.*
 †A. A. Jones, M. S. A., *Asst. Chem.*
 *C. D. Learn, M. A., *Asst. Hort., Bot.*
 *†E. I. Lichti, B. S., *Asst. Ent.*

*Portia Losey, B. S., *Asst. Boys' and Girls' Club Work*.
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 *Josiah Main, A. M., *Sch. Agr.*
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 *†D. C. Mooring, M. S., *Asst. Hort., Bot.; Asst. Hort.*
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 *H. M. Potter, A. M., (*Asst.*) *Chem.*
 *†R. C. Potts, B. S., *Dairying*.
 *L. B. Ritter, B. S., *Asst. Bact.*
 *†A. F. Rolf, B. A., *Instr. Poultry Husb.; Poultry Husb.*
 *†C. E. Sanborn, M. A., *Ent.*
 *†W. P. Shuler, D. V. M., M. S., *Asst. Zool., Vet. Med.; Asst. Bact.*
 *H. L. Thomson, B. A., *Asst. Agron.*
 *R. O. Whittenton, A. B., *Asst. Zool.*
 *T. B. Wortman, *Supervisor Boys' and Girls' Agr. Clubs*.
 *†A. H. Wright, B. S., (*Asst.*) *Agron.; Asst. Agron.*

Agricultural and Normal University, Langston.

*College faculty.

*I. E. Page, A. M., *President*.

*Mary J. McCain, B. S. D., *Dom. Sci.*
 *Mary L. McCrary, *Dom. Econ.*
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OREGON.

Oregon State Agricultural College and the Agricultural Experiment Station, Corvallis.

*College faculty. †Station staff.

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†R. W. Allen, M. S., *Supt. Br. Sta., Hermiston*.
 *Winifred M. Atwood, M. S., *Instr. Bot., Plant Path.*
 †F. D. Bailey, M. S., *Asst. Crop Pest Invest.*

*W. A. Barr, B. S., *Dairying, Ext. Div.*
 †H. P. Bars, M. S., *Research Asst. Plant Path.*
 *†T. D. Beckwith, M. S., *Bact.*
 *W. A. Bevan, B. S., *Instr. Phys.*

¹ On leave.

- *G. B. Blair, A. M., *Instr. Phys.*
 *I. H. Blake, A. M., *Instr. Zool., Physiol.*
 *†A. G. B. Bouquet, B. S., (*Asst.*) *Veg. Gard.; Oler.*
 *E. M. D. Bracker, B. S., *Instr. Farm Mech.*
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 †L. R. Brethaupt, B. S., *Supt. Br. Sta., Burns*
(Coop. U. S. D. A.).
 *R. K. Brodie, M. S., (*Asst.*) *Gen. Chem.*
 *Helen B. Brooks, *Dom. Art.*
 †F. R. Brown, B. S., *Research Asst. Hort.*
 *W. S. Brown, B. S., *Hort., Ext. Div.*
 †Lyman Bundy, B. S., *Asst. Chem.*
 *Mrs. Henrietta W. Calvin, B. S., *Dean Sch. Dom.*
Sci. and Art.
 *†G. V. Copson,¹ M. S., *Asst. Bact.*
 *M. R. Daughters, A. M., (*Asst.*) *Org. Chem.*
 *Alice M. Dolman, M. S., *Instr. Dom. Sci.*
 *†James Dryden, *Poultry Husb.*
 *R. A. Dutcher, M. S., *Instr. Agr. Chem.*
 *Alice L. Edwards, B. S., *Instr. Zool.*
 †H. E. Ewing, Ph. D., *Research Asst. Ent.*
 *E. B. Fitts, *Dairy and An. Husb., Ext. Div.*
 *H. T. French, M. S., *Farm Dem. and Ext. Work*
(Coop. U. S. D. A.).
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 †G. H. Godfrey, B. S., *Lab. Asst. Plant Path.*
 *†R. R. Graves, M. S., *Dairy Husb.*
 *F. L. Griffin, M. S., (*Assoc.*) *Agr. Ed.*
 *R. D. Hetzel, A. B., LL.B., *Dir. Ext. Div. and*
Farmers' Insts.
 *Katherine M. Hitchcock, *Instr. Dom. Art.*
 *G. D. Horton, M. S., *Instr. Bact.*
 *†G. R. Hyslop, B. S., (*Asst.*) *Crop Prod.; Asst.*
in Crop Work.
 *†H. S. Jackson, A. B., *Bot., Plant Path.*
 *Dorothy Keatley, B. S., *Asst. Dom. Art.*
 *Ida A. Kidder, B. L. S., *Libr.*
 †E. J. Kraus, B. S., *Research Assoc. Hort.*
 †C. C. Lamb, *Foreman Poultry Plant.*
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 *M. J. Lazelle, B. S., *Dairying, Ext. Div.*
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 *†M. M. McCool, Ph. D., (*Asst.*) *Soils; Asst. in Soils.*
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 *Hilda Miller, B. S., *Instr. Chem.*
 *Barbara Moore, B. S., *Instr. Dom. Art.*
 *†O. M. Nelson, B. S., *Instr. An. Husb.; Asst. An.*
Husb.
 *H. S. Newins, Ph. B., M. F., *For.*
 *C. E. Owens, *Instr. Bot.*
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Asst. Irrig., Drainage.
 *Elta M. Raber, B. S., *Instr. Dom. Art.*
 †G. S. Ralston, B. S., *Research Asst. Hort.*
 †F. C. Reimer, M. S., *Supt. Br. Sta., Talent.*
 *E. D. Ressler, A. M., *Indus. Pedag.*
 *Lulie W. Robbins, B. S., *Dom. Sci. and Art, Ext.*
Div.
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 *F. L. Robinson, *Foreman Coll. Stock Farm.*
 †R. H. Robinson, M. S., *Research Asst. Chem.*
 †V. I. Saftro, B. S. A., *Research Asst. Ent.*
 *†G. R. Samson, B. S., *Instr. An. Husb.; Asst. An.*
Husb.
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 *M. J. Seeley, *Instr. Chem.*
 *B. T. Simms, (*Asst.*) *Vet. Sci.*
 *†O. G. Simpson, B. S., *Instr. Dairy Husb.; Asst.*
Dairy Husb.
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 *J. M. Speidel, B. S., *Instr. Hort.*
 †C. C. Starring, B. S., *Hort. Br. Sta., Hood River.*
 †D. E. Stephens, B. S., *Supt. Br. Sta., Moro (Coop.*
U. S. D. A.).
 *†E. R. Stockwell, B. S., *Instr. Dairy Husb.; Asst.*
Dairy Husb.
 *G. F. Sykes, M. A., (*Asst.*) *Zool., Physiol.*
 *†H. V. Tartar, B. S., (*Assoc.*) *Agr. Chem.; Chem.*
 *†A. F. Vass, M. S., *Instr. Bact.; Research Asst.*
Bact.
 *E. P. Walls, M. S., *Instr. Bot.*
 *Willibald Weniger, Ph. D., *Phys.*
 *†H. F. Wilson, M. S., (*Asst.*) *Ent.; Ent.*
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River.
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Union.
 †A. M. Wodman, B. S., *Orchard Foreman.*

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The School of Agriculture and Agricultural Experiment Station of the Pennsylvania State College, State College.

*College faculty. †Station staff.

*E. E. Sparks, Ph. D., LL. D., *President of College.*

*†R. L. Watts, M. S., *Dean School Agr. Dir. Sta. Hort. (*†)*

*†J. F. Adams, B. S., *Instr. Bot.; Asst. Bot.*

*†E. L. Anthony, B. S., *Instr. Dairy Husb.; Asst.*
Dairy Husb.

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*†S. I. Bechdel, B. S., *Instr. Dairy Husb.*

*†A. R. Bechtel, M. S., *Instr. Bot.; Asst. Bot.*

*†J. R. Bechtel, B. S., *Asst. Hort.*

*†R. H. Bell, B. S., *Asst. Expt. Pomol.*

*†I. J. Bibby, M. S., *Asst. Dairy Husb.*

*†R. U. Blasingame, B. S., *Instr. Agron.; Asst.*
Agron.

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*†F. M. Crawford, B. S., *Asst. Chem.*

*†W. H. Darst, B. S. (*Asst.*) *Agron.; Asst. Agron.*

*†H. P. Davis, B. S., *Asst. Expt. Dairy Husb.*

¹ On leave.

- *†J. B. Demaree, B. S., *Instr. Bot.; Asst. Bot.*
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 *†H. D. Edmiston, *Lab. Asst.*
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 *†Paul Gerlaugh, B. S., *Asst. An. Husb.*
 *†G. C. Given, B. S. (*Asst.*) *Expt. Agr. Chem.; Expt. Agr. Chem.*
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 *†W. R. Gorham, B. S. (*Asst.*) *Agr. Ext.; Agr. Ext.*
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 *†E. K. Hibshman, B. S., *Expert Farm Mgt. (Coop. U. S. D. A.).*
 *†C. W. Hickman, B. S., *Asst. An. Husb.*
 *†J. B. Hill, Ph. D. (*Asst.*) *Bot.; Asst. Bot.*
 *†F. J. Holben, B. S., *Asst. Chem.*
 *†M. G. Kains,¹ M. S., *Hort.*
 *†F. D. Kern, Ph. D., *Bot.*
 *†M. C. Kilpatrick, *Instr. Poultry Husb.; Asst. Poultry Husb.*
 *†F. P. Knoll, *Asst. Butter Making.*
 *†H. R. Kraybill, B. S., *Asst. Chem.*
 *†C. W. Larson, M. S., *Dairy Husb.*
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 *†R. S. Maddox, M. F., *Instr. For.; Asst. For.*
 *†T. I. Mairs, M. S., *Agr. Ed. Supt. Corresp. Courses.*
 *†Elizabeth B. Meek,² M. S. (*Asst.*) *Bact.; Bact.*
 *†Earle L. Moffit, B. S., *Field Asst. in Soil Survey; Asst. Agron.*
 *†C. E. Myers, M. S., *Assoc. Agron.*
 *†C. F. Noll, M. S. (*Asst.*) *Expt. Agron.; Asst. Expt. Agron.*
 *†C. R. Orton, M. S. (*Asst.*) *Bot.; Asst. Bot.*
 *†F. S. Putney, M. S. (*Asst.*) *Dairy Husb.; Asst. Dairy Husb.*
 *†J. A. Runk, B. S., *Instr. Hort.; Asst. Hort.*
 *†B. O. Severson, B. S. (*Asst.*) *An. Husb.; Asst. An. Husb.*
 *†J. P. Stewart, Ph. D., *Expt. Pomol.*
 *†C. W. Stoddart, Ph. D., *Agr. Chem.*
 *†Walter Thomas, B. S., *Asst. Chem.*
 *†W. H. Tomhave, B. S., *An. Husb.*
 *†W. E. Tripp, *Instr. Bact.; Asst. Bact.*
 *†R. A. Waldron, M. S., *Instr. Bot.; Asst. Bot.*
 *†D. E. Warner, jr., B. S., *Asst. Poultry Husb.*
 *†F. P. Weaver, *Instr. Agr. Chem.; Asst. Agr. Chem.*
 *†J. W. White, M. S., *Assoc. Agron.*
 *†W. R. White, M. S., *Instr. Agr. Ed.; Agr. Ed.*
 *†E. I. Wilde, B. S., *Instr. Hort.; Asst. Hort.*
 *†E. L. Worthen, M. S. (*Asst.*) *Agron.; Asst. Agron.*

Pennsylvania State College Institute of Animal Nutrition, State College.

†Institute staff.

†H. P. Armsby, Ph. D., LL. D., *Dir.*

†W. W. Braman, M. S., *Assoc. in An. Nutr.*
 †D. C. Cochrane, B. S., *Asst. An. Husb.*
 †J. A. Fries, M. S., *Asst. Dir.*

†K. K. Jones, M. S., *Asst. in An. Nutr.*
 †D. H. Kauffman, B. S., *Asst. in An. Nutr.*
 †J. W. Park, B. S., *Asst. in An. Nutr.*

PORTO RICO.

College of Agriculture and Mechanic Arts of the University of Porto Rico, Mayaguez.

*College faculty.

*E. M. Bainter, *President University.*

*R. I. Smith, B. S., *Acting Dean College. Zool., Ent.*

*A. Fredholm, Ph. D., *Agron.*
 *C. L. Lang, B. S., *Phys.*
 *Katherine Parker, B. S., *Instr. Dom. Econ.*
 *G. A. Perkins, *Asst. Chem.*
 *Miss E. Prats, B. S., *Instr. Biol.*

*B. J. Ray, Ph. D., *Chem.*
 *E. J. Ritzman, *An. Husb.*
 *Mrs. Adeline C. Stevens, B. S., *Dom. Econ.*
 *Margaret Woods, *Asst. in Home Econ. Lab.*

Agricultural Experiment Station, Mayaguez.

Under the supervision of A. C. True, Director Office of Experiment Stations, United States Department of Agriculture.

†Station staff.

†D. W. May, M. Agr., *Special Agt.*

†G. L. Fawcett, B. S., *Plant Path.*
 †P. L. Gile, A. B., *Chem.*
 †W. E. Hess, *Plant Propagator.*

†C. F. Kinman, B. S., *Hort.*
 †T. B. McClelland, A. B., *Asst. Hort.*
 †R. H. Van Zwaluwenburg, B. S., *Ent.*

¹ Assumes duties July 15, 1914.

² On leave.

Sugar Producers' Experiment Station, Rio Piedras.

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*College faculty. †Station staff.

*Howard Edwards, M. A., LL.D., *President.**†B. L. Hartwell, Ph.D., *Dir. Sta. Agr. Chem. (*)*; *Agron., Chem. (†)**G. E. Adams, B. S., *Agron.**John Barlow, M. A., *Zool.**Howland Burdick, B. S., *Instr. Dairying, Mgr. Farm.**Gladys E. Burlingame, A. B., *Libr.*†Dorothy W. Caldwell, B. S., *Asst. An. Brdg., Path.**Mabel Campbell, B. D. S., *Home Econ.**G. R. Cobb, B. S., *Hort.**R. B. Cooley, B. S. A., *An. Husb.*†L. S. Crosby, A. B., *Asst. Chem.*†S. C. Damon, B. S., *Asst. Field Expts.**L. P. Dickinson, B. S., *Phys.*†F. O. Fitts, B. S., *Asst. Chem.**F. J. Godin, B. S., *Instr. Hort., Florist.**†P. B. Hadley, Ph.D., *Bact.; An. Brdg., Path.*†Nathaniel Helme, *Met.*†W. C. Irons, B. S., *Asst. in Field Expts.**D. J. Lambert, *Instr. Poultry Husb.**V. L. Leighton, Ph.D., *Chem.**†R. A. Lichtenhaeler, M. S., *Instr. Geol.; Asst. Chem.*†C. H. Magoon, *Poultryman.*†E. Elizabeth Mearns, *Libr.*†G. E. Merkle, B. S., *Asst. Chem.**Harriet L. Merrow, M. A., *Bot.*†F. R. Pember, M. S., *Asst. Glasshouse Expts.**F. H. Smith, M. S., *(Asst.) Chem.**A. E. Stene, M. S., *Supt. Coll. Ext. (State Ent.)**E. K. Thomas, *Instr. Sch. Gard., Nature Study (Ext.)*†P. H. Wessels, M. S., *Asst. Chem.***SOUTH CAROLINA.****Clemson Agricultural College and the Agricultural Experiment Station, Clemson College.**

*College faculty. †Station staff.

*W. M. Riggs, E. and M. E., LL. D., *President. Consulting Engin. (*)**†J. N. Harper, M. Agr., *Dir. Agr. Dept. Dir. Sta. Agron. (†)*†W. B. Aull, B. S., *Asst. Bot.**W. A. Barnette, D. V. M., *Asst. State Vet.**†H. W. Barre, M. A., *Bot., For., Bact.; Bot., Plant Path.**R. N. Brackett, Ph. D., *Dir. Chem. Dept. (State Chem.)**L. B. Brandon, B. S., *Foreman Coll. Farm.**J. M. Burgess, B. S., *(Assoc.) Dairying.**F. H. H. Calhoun, Ph. D., *Geol., V. Dir. Agr. Dept.**P. E. Calvin, *Live Stock Dem. Agt., Ext. Div.**†O. M. Clark, B. S., *(Asst.) Agron.; Asst. Agron.**†A. F. Conradi, M. S., *Ent., Zool.; Ent. (State Ent.)**†F. J. Crider, M. S. A., *(Assoc.) Hort.; Assoc. Hort.*†R. E. Currin, *Supt. Pee Dee Substa., Florence.**†H. C. Egerton, B. S., *(Marion), Asst. Ent., Ext. Div.; Asst. Ent.**R. O. Feeley, D. V. S., *Asst. State Vet.**Benjamin Freeman, B. S., *Asst. Chem.*†Burns Gillison, *Foreman Farm.*†J. A. Goodwin, B. S., *Supt. Coast Land Sta., Summerville.**M. B. Hardin, *Chem. Emeritus.**F. C. Hare, *Poultry Dem. Agt., Ext. Div.**D. H. Henry, B. S., *(Assoc.) Chem.**†W. L. Hutchinson, M. S., *Agron.; Assoc. Agron.**†T. E. Keitt, B. S., *Soils; Chem.**G. F. Lipscomb, B. S., *(Asst.) Chem.**W. W. Long, *Dir. Ext. Div. and Farmers' Insts. State Dem. Agt. (Coop. U. S. D. A.)**R. B. Lowry, B. S., *(Asst.) Agron., Farm Mech.**R. H. Mason, B. S., *Dairying, Ext. Div. (Coop. U. S. D. A.)**J. H. Mitchell, M. S., *(Asst.) Chem.**†C. C. Newman, B. S., *Hort.**C. F. Niven, M. S., *Asst. Hort., Ext. Div.**W. T. Pearce, B. S., *Instr. Chem.**T. G. Poats, M. E., E. E., *Phys.**†M. R. Powers, D. V. S., *Vet. Sci.; Consult. Vet. (State Vet.)**M. L. Quigley, D. V. M., *Asst. State Vet.*†T. R. Risher, B. S., *Asst. Chem.**S. S. Rittenberg, *Agr. Publicist.**†F. M. Rolfs, Ph. D., *(Assoc.) Bot., Bact.; Assoc. Bot., Path.**D. B. Rosenkrans, A. B., *Asst. Bot. (Bact.)*†T. A. Rouse, B. S., *Asst. An. Husb.**†R. L. Shields, B. S. A., *An. Husb., Dairying; An. Husb.*†F. G. Tarbox, jr., B. S., *Asst. Agron.**†W. A. Thomas, B. S., *(Asst.) Ent., Zool.; Asst. Ent.**Katherine B. Trescott, *Libr.*†L. O. Watson, B. S., *Field Path.**J. T. Watt, *Live Stock Dem. Agt., Ext. Div.*

The Colored Normal, Industrial, Agricultural, and Mechanical College of South Carolina,
Orangeburg.

*College faculty.

*R. S. Wilkinson, Ph. D., *President. Agr. Phys. Ext. Work.*

*Mrs. Mattie J. Battiste, *Instr. Dom. Econ.*

*H. P. Butler, M. A., *V. Pres.*

*Clara C. Davis, *Instr. Sew.*

*Mrs. Cornelia J. Gregg, *Instr. Dom. Econ.*

*B. F. Hubert, B. S., *Head Agr. Dept., Agr., Chem.*

*G. W. Irwin, *Instr. Dairying, Truck Gard., An. Indus.*

*C. H. Jones, *Instr. Nature Study.*

*E. A. Lawrence, A. B., *Rural Sociol.*

*Boliver Levister, M. A., *Agr. Hist.*

*C. S. Myers, *Instr. Agr. Farm Supt.*

*P. P. Watson, *Rural Econ.*

SOUTH DAKOTA.

South Dakota State College of Agriculture and Mechanic Arts and the Agricultural Experiment Station, Brookings.

*College faculty. †Station staff.

*G. L. Brown, Ph. D., *Actg. Pres. V. Pres.*

*J. W. Wilson, M. S. A., *Dir. Sta. An. Husb. (*†)*

*G. B. Atwood, B. S., *Asst. Vet. Med.*

†D. E. Bailey, B. S., *Dairy Analyst.*

*Manley Champlin, B. S., *Asst. Agron.; Cereal Work (Coop. U. S. D. A.).*

*H. S. Coe, B. S., *Asst. Bot.; Consult. Bot.*

*B. A. Dunbar, M. A., *(Assoc.) Chem.*

*Matthew Fowlds, B. S., *Asst. Agron.*

*J. M. Fuller, B. S., *(Assoc.) Dairy Husb.; Dairy Bact.*

*H. W. Gregory, B. S., *Asst. Dairy Husb.*

*N. E. Hansen, M. S., *Hort., For. V. Dir. Sta.*

*A. N. Hume, Ph. D., *Agron. Supt. Substas.*

*J. G. Hutton, M. S., *(Assoc.) Agron.; Asst. Agron.*

*†Christian Larsen, M. S. A., *Dairy Husb.*

†R. A. Larson, *Sec.*

*C. C. Lipp, D. V. M., *Vet. Med.; Consult. Vet.*

†Howard Loomis, B. A., *Agron. Analyst.*

*H. B. Mathews, M. S., *Phys.*

*C. W. Michel, M. A., *Bot.*

*S. P. Miller, A. M., *Zool.*

†J. D. Morrison, *Crops (Coop. U. S. D. A.).*

*Julia Nichols, *Instr. Home Econ.*

*W. H. Powers, M. A., *Libr.*

*H. C. Severin, M. A., *Ent., Nature Study. (State Ent.).*

*†Clarence Shanley, B. S., *Asst. Dairy Husb.*

*†J. H. Shepard, B. S., *Chem.*

*G. A. Starring, *Indus. Journalism.*

*E. D. Stivers, B. S., *Secon. Agr. Ed., Dir. Corresp. Courses.*

*†F. C. Stollenberg, *Florist.*

*B. L. Thompson, B. S., *(Assoc.) An. Husb.*

*Mary Tough, *Home Econ.*

*†G. E. Youngburg, Ph. G., M. S., *Asst. Chem.*

TENNESSEE.

College of Agriculture and the Agricultural Experiment Station of the University of Tennessee,
Knoxville.

*College faculty. †Station staff.

*Brown Ayres, Ph. D., LL. D., D. C. L., *President of University.*

*†H. A. Morgan, B. S. A., *Dir. Sta. Zool., Ent. (*†)*

*†S. M. Bain, A. B., *Bot.*

*†G. M. Bentley, M. A., *(Assoc.) Ent.; Ent. (State Ent., Plant Path.).*

†R. G. Briggs, *Asst. Hort.*

†F. H. Broome, *Libr.*

†Oscar Campbell, *Asst. Plat Expts., Jackson.*

†W. A. Campbell, *Farm Foreman.*

†J. E. Converse, *Asst. Coop. Expts., Crossville.*

†S. H. Essary, M. S., *Asst. Bot., Mycol.*

*Lucy E. Fay, A. M., B. L. S., *Libr.*

*C. H. Gordon, Ph. D., *Geol.*

†J. I. Hardy, B. S., *Asst. Chem.*

*Lena B. Henderson, B. S., *Instr. Bot.*

*C. O. Hill, M. S., Ph. C., *(Assoc.) Org. and Agr. Chem.*

*†Moses Jacob, V. M. D., *Vet. Sci.; Vet.*

*†C. A. Kaffer, M. S., *Hort., For.; Hort. Dir. Ext. Div.*

†W. H. McIntire, M. S., *Soil Chem.*

†C. A. Mooers, B. S., *Chem., Agron.*

*Frank Morell, M. S., *Asst. Chem. Lab.*

*†Maurice Mulvanian, M. S., *(Asst.) Bact.; Bact.*

†L. R. Neel, B. S. A., *Asst. Coop. Expts., Nashville.*

*J. T. Porter, Ph. D., *Phys.*

*J. C. Pridmore, M. S., *(Assoc.) Agron.*

†S. A. Robert, B. S., *Supt. West Tenn. Sta., Jackson.*

†W. N. Rudd, *Asst. Coop. Expts., McMinnville.*

*A. A. Schaeffer, Ph. D., *(Assoc.) Zool.*

*Mary Scott, *Asst. Home Econ.*

†S. M. Spangler, *Asst. in Plat Work.*

*Louise G. Turner, M. A., *(Assoc.) Home Econ.*

*†J. F. Voorhees, M. S. A., *Instr. Met.; Consult. Met.*

*C. E. Wait, C. E., M. E., Ph. D., *Chem.*

†H. R. Watts, *Asst. Ent.*

†L. G. Willis, B. S., *Asst. Chem.*

*†C. A. Willson, M. S. A., *An. Husb., Dairying.*

TEXAS.

Agricultural and Mechanical College of Texas and the Agricultural Experiment Station,
College Station.

*College faculty. †Station staff.

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 *O. M. Ball, Ph. D., *Biol.*
 *E. F. Bates, M. S., *Instr. Phys.*
 *F. W. Bell, B. S., *Instr. An. Husb.*
 *†S. W. Bilsing, M. A., *Instr. Ent.; Asst. Ent.*
 †E. E. Binford, B. S., *Supt. Substa., Beeville.*
 *G. H. Blackmon, B. S., (*Asst.*) *Hort.*
 †F. H. Blodgett, Ph. D., *Plant Path., Physiol.*
 *W. T. Bryant, Ch. E., *Asst. Chem.*
 †T. W. Buell, B. S., *Supt. Substa., Denton.*
 *L. B. Burke, B. S., *Instr. An. Husb.*
 *†J. C. Burns, B. S., *An. Husb.*
 *Bernice Carter, *Girls' Club Work (Coop. U. S. D. A.).*
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 †J. W. Chewning, B. S., *Asst. Chem.*
 *J. A. Clutter, B. S., *Instr. Dairy Husb.*
 †A. B. Conner, B. S., *Agron. Asst. Dir.*
 †V. L. Cory, B. S., *Supt. Substa., Lubbock.*
 †R. E. Dickson, B. S., *Asst. Agron.*
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 †R. W. Edwards, B. S., *Supt. Coop. Substa., Chillicothe (U. S. D. A.).*
 *C. M. Evans, M. S., *Supt. Ext. Dept.*
 *†Mark Francis, D. V. M., *Vet. Sci.; Vet.*
 †G. S. Fraps, Ph. D., *Chem. (State Chem.).*
 *E. C. Gee, B. S., *Instr. Agron.*
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 *H. E. Hayden, M. A., (*Asst.*) *Biol.*
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 *C. C. Hedges, Ph. D., *Chem.*
 †Frank Hodges, B. S., *Asst. Chem. (State Work).*
 †W. S. Hotchkiss, *Supt. Substa., Troupe.*
 †L. A. Hudgins, B. S., *Asst. Chem. (State Work).*
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 *C. N. Kennedy, B. S., *Instr. An. Husb.*
 *E. J. Kyle, M. S. A., *Dean School Agr. Hort.*
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 †A. H. Leidigh, B. S., *Agron.*
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 †G. T. McNess, *Supt. Substa., Nacogdoches. (Coop. U. S. D. A.).*
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 *A. E. Nichols, *Instr. Biol.*
 *C. B. Nichols, *Sec. Ext. Dept.*
 †T. L. Ogier, B. S., *Asst. Chem. (State Work).*
 *†F. B. Paddock, B. S., (*Assoc.*) *Ent.; Asst. Ent.*
 *A. T. Potts, B. S., (*Asst.*) *Hort.*
 *W. F. Proctor, *State Agt. Dem. Work (Coop. U. S. D. A.).*
 †J. B. Rather, M. S., *Asst. Chem.*
 *E. L. Reed, B. S., *Instr. Biol.*
 *J. W. Ridgway, M. S., (*Actg.*) *Dairy Husb.*
 *R. R. Rosa, B. S., *in charge Exhibits.*
 †C. S. Scharff, *Actg. Supt. Feed. and Brdg. Sta., College Station.*
 †H. Schmidt, B. S., D. V. M., *Asst. Vet.*
 *F. J. Skeeler, B. S., *Instr. Phys.*
 †H. B. Spaulding, B. S., *Asst. Chem. (State Work).*
 †H. C. Stewart, B. S., *Supt. Substa., Pecos.*
 †A. K. Short, M. S., *Supt. Temple-Belton Substa., Temple.*
 *E. A. Talbot, B. S., *Asst. Dairy Husb.*
 *J. L. Thomas, *Dairying (Coop. U. S. D. A.).*
 *M. K. Thornton, jr., B. S., *Instr. Chem.*
 †R. E. Willard, B. S., *Farm Mgt. (Coop. U. S. D. A.).*
 *H. H. Williamson, B. S., *Club Work (Coop. U. S. D. A.).*
 †N. E. Winters, B. S., *Supt. Substa., Angleton.*
 *C. A. Wood, B. S., *Instr. Agron.*
 *W. T. Wright, B. S., (*Actg.*) *Phys.*
 †I. S. York, *Supt. Substa., Spur.*

Prairie View State Normal and Industrial College, *Prairie View.*

*College faculty.

*E. L. Blackshear, *Principal.*

- *Lizzie Anderson, (*Asst.*) *Cooking.*
 *Mamie Atherton, (*Asst.*) *Cooking.*
 *Ruth Cox, (*Asst.*) *Sew.*
 *H. S. Estelle, *Asst. Agr.*
 *A. D. Ewell, *Foreman Laundry.*
 *Mrs. R. L. Ewell, *Asst. Laundry.*
 *Katie Fulton, (*Asst.*) *Sew.*
- *John Harris, *Asst. Agr.*
 *J. T. Hodges, *Libr.*
 *Miss E. E. Houseworth, *Sew., Millinery.*
 *Miss R. E. Lyman, *Cooking, Dom. Econ.*
 *J. V. Smith, *Asst. Agr.*
 *C. H. Waller, *Agr., Farm Supt.*

UTAH.

Agricultural College of Utah and the Agricultural Experiment Station, Logan.

*College faculty. †Station staff.

*J. A. Widtsoe, Ph.D., *President.**†E. D. Ball, Ph.D., *Dir. Sta. Dir. Sch. Agr. Ent., Ext. Div.**†Byron Adler,¹ B.S., (*Asst.*) *Poultry Husb.; Poultryman.**†L. D. Batchelor,¹ Ph.D., *Hort.**S. L. Bingham, *Asst. in Dairying.**C. F. Brown, M.S., *Drainage Engin., Ext. Div.**J. T. Caine, III, M.S.A., *An. Husb. Asst. Dir. Ext. Div.**†C. Y. Cannon, B.S., *Instr. An. Husb.; Asst. An. Husb.**†W. E. Carroll,^{1,2} M.S., *Asst. Dir. Sch. Agr., (Assoc.) An. Husb. An. Husb.**Rhoda B. Cook, (*Asst.*) *Dom. Art.**Blanche Cooper,¹ B.S., *Home Econ.**Alice A. Dunford, B.S., *Instr. Dom. Sci.**†A. D. Egbert, D.V.M., *Foreman Poultry Husb.; Asst. Poultryman.**B. R. Eldredge, *Dairy Agt., Ext. Div. (Coop. U. S. D. A.).*†A. D. Ellison, B.S., *Asst. Agron., Nephi Substa. (Coop. U. S. D. A.).**R. J. Evans, Ph.D., *State Leader Farm Mgt. (Coop. U. S. D. A.). Plant Brdg.**†H. J. Frederick,¹ D.V.M., *Vet. Sci.; Vet.**†J. E. Greaves, Ph.D., *Bact., Physiol. Chem.; Bact.*†Violet Greenhalgh, *Libr.**†L. J. Haddock, B.S., *Pubs., Ext. Div.**†F. S. Harris,¹ Ph.D., *Agron. Dir. Sch. Agr. Engin.*†R. A. Hart, M.E., *Drainage Engin. (Coop. U. S. D. A.).**†G. R. Hill, jr.,¹ Ph.D., *Bot.; Plant Path.**†C. T. Hirst, B.S., *Instr. Chem.; Asst. Chem.**J. C. Hogenson, M.S.A., *Agron., Ext. Div. School Coop. Club Work.**Coral Kerr, B.S., *Instr. Dom. Arts.**†J. I. Lauritzen, B.S., *Instr. Bot.; Asst. Plant Path.**J. H. Linford, D. Di., *Corresp. Studies, Ext. Div.**Amy Lyman, B.S., *Instr. Home Econ. County Dem.**Gertrude M. McCheyne, B.S., *Home Econ., Ext. Div.**Elizabeth O. McKay, B.S., *Foods, Dietetics.*†W. W. McLaughlin, B.S., *Irrig. Engin. (Coop. U. S. D. A.).*†H. J. Maughan, B.S., *Asst. Agron.**H. J. Pack, B.S., *Instr. Zool.**E. G. Peterson, Ph.D., *Dir. Ext. Div.**William Peterson,¹ B.S., *Geol.**C. W. Porter, A. M., *Dir. Sch. Home Econ. (Assoc.) Chem.**†B. L. Richards, B.S., *Instr. Bot.; Asst. Plant Path.**David Sharp, jr., B.S., *County Dem.**Elizabeth C. Smith, B.L., *Libr.**†L. A. Smith, B.S., *Instr. Bact.; Asst. Bact.**†George Stewart, B.S., *Instr. Agron.; Asst. Agron.**†John Stewart,¹ B.S., (*Asst.*) *Chem.; Assoc. Research Chem.**†Robert Stewart,¹ Ph.D., *Chem.; Asst. Dir., Chem.**R. H. Stewart, B.S., *Instr. Farm Mgt. County Dem. (Coop. U. S. D. A.).*†H. W. Stucki, B.S., *Asst. Agron.**†Howard Sweltzer, B.S., *Instr. Hort.; Asst. Hort.**Mathoniah Thomas, LL.B., *Special Lect. Irrig. Law.**†E. G. Titus,¹ Sc.D., *Zool., Ent.; Ent.**J. P. Welch, B.S., *Instr. Farm Mgt. County Dem. (Coop. U. S. D. A.).**†F. L. West, Ph.D., *Phys.; Mct.**R. B. West,¹ C.E., *Agr. Engin.**Robert Wrigley, B.S., *County Dem.*

VERMONT.

College of Agriculture and the Agricultural Experiment Station of the University of Vermont, Burlington.

*College faculty. †Station staff.

*G. P. Benton, D.D., LL.D., *President of University.**†J. L. Hills, Sc.D., *Dean Coll. Agr. Dir. Sta. Agron. (*)*†H. E. Bartram, B.S., *Asst. Plant Path.**†A. A. Borland, M.S., *An. and Dairy Husb.**Thomas Bradlee, B.S.A., *Dir. Ext. Service.**R. T. Burdick, B.S., *Instr. Agron., Farm Mech.**†G. P. Burns, Ph.D., *Bot.**B. A. Chandler, M.F., *Instr. For.**†M. B. Cummings, Ph.D., *Hort.*†G. C. Cunningham, B.S., *Asst. Plant Path., Bact.*†F. C. Fiske, B.S., *Farm Supt.*†W. F. Hammond (Middlebury), *Expert Horse Brdg. (Coop. U. S. D. A.).*†Stanley Hargreaves, *Gardener.*†A. F. Hawes, M.F., *For. (State For.).**F. K. Jackson, M.D., *Physiol.**F. B. Jenks, B.S., *Agr. Ed.*†C. H. Jones, M.S., *Chem.**M. A. Jull, B.S.A., *Lect. Poultry Husb.**C. A. Kern, B.S., (*Asst.*) *Chem.*†W. J. Lamplough, B.S., *Computer.**†E. H. Loveland, M.A., *Asst. Dairy Husb.**†B. F. Lutman, Ph.D., *Plant Path.**Josephine A. Marshall, B.S., *Instr. Home Econ.**N. F. Merrill, Ph.D., *Chem.**A. K. Peitersen, M.A., *Instr. Bot.**H. F. Perkins, Ph.D., *Zool.**†F. A. Rich, V.S., M.D., *Vet. Sci.; Vet.*†Jennie L. Rowell, B.S., *Asst. Chem.**Helen B. Shattuck, A.B., *Libr.*†C. P. Smith, *Treas.*†W. C. Stone, B.S., *Asst. Hort.**Bertha M. Terrill, A.M., *Home Econ.*†C. G. Williamson, B.S., *Asst. Chem.*¹ Engaged also in Extension Work.² On leave.

VIRGINIA.

Virginia Agricultural and Mechanical College and Polytechnic Institute, and the Agricultural Experiment Station, Blacksburg.

*College faculty. †Station staff.

*J. D. Eggleston, A. B., *President.*†S. W. Fletcher,¹ Ph. D., *Dir. Sta.*†B. G. Anderson, B. S., *Supt. Appomattox Sta.*
(*Coop. U. S. D. A.*).†E. T. Batten, B. S., *Asst. Agron.**†W. K. Brainerd, B. S., *Dairy and An. Husb.;*
*Dairy Husb.**†Lyman Carrier, M. Agr., *Agron. Supervisor*
*County Expt. Stas.**W. G. Chrisman, D. V. S., *Vet. Sci.*†R. P. Cocke, *Supt. Williamsburg Sta.*†C. H. Crabill, M. S., *Asst. Plant Path.**R. J. Davidson, A. M., *Agr. Chem.*†D. D. Digges, B. S., *Supt. Charlotte Sta.*†A. W. Drinkard, jr., Ph. D., *Assoc. Hort.*†W. B. Ellett, Ph. D., *Chem.*†W. W. Green, *Supt. Bowling Green and Louisa*
Stas. (Coop. U. S. D. A.).†W. G. Harris, M. S., *Asst. Chem.*†J. C. Hart, B. S., *Supt. Chatham and Axton Stas.*
(*Coop. U. S. D. A.*).†H. H. Hill, M. S., *Asst. Chem.*†A. N. Hodgson, M. S., *Supt. Martinsville Sta.**†E. R. Hodgson, M. S., (*Assoc.*) *Agron.; Assoc.*
*Agron. Supt. Staunton Expt. Farm.**C. W. Holdaway, B. S., (*Assoc.*) *Dairy Husb.,*
*Supt. Creamery.**R. J. Holden, M. S., *Geol.**R. E. Hunt, B. S., (*Assoc.*) *An. Husb.**Elinor I. Jones, *Libr.**J. B. Lucas, B. S., *Asst. Chem.**J. B. McBryde, C. E., *Chem.**J. M. McBryde, Ph. D., Sc. D., *Pres. Emeritus.**†H. L. Price, M. S., *Dean Agr. Dept. Hort.**†H. S. Reed, Ph. D., *Mycol., Bact., Plant*
*Path.**F. L. Robeson, M. E., (*Assoc.*) *Phys.*†W. J. Schoene, M. S., *Ent. (State Ent.).**E. A. Smyth, jr., A. M., LL. D., *Biol.**H. S. Stahl, M. S., *Instr. Biol.**†G. C. Starcher, B. Agr., *Instr. Hort.; Asst.*
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†Station staff.

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*College faculty.

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WASHINGTON.

State College of Washington and the Agricultural Experiment Station, Pullman.

*College faculty. †Station staff.

*E. A. Bryan, A. M., LL. D., *President*.*†I. D. Cardiff, Ph. D., *Dir. Sta. Head Bot. Dept. (*)*; *Plant Physiol. (*)*; *Dir. Dept. Dry Land Dem. and Expt. (†)**F. W. Allen, M. S. A., *Instr. Hort.**R. J. Barnett, M. S., (*Assoc.*) *Pomol.**C. Lillian Blanchard, *Instr. Poultry Indus.*†H. L. Blanchard, *Dairy, Poultry Invest., Asst. Supt. Substa., Puyallup.**C. M. Brewster, A. M., (*Asst.*) *Inorg. and Phys. Chem.**I. D. Charlton, B. S., (*Asst.*) *Farm Mech.**G. L. Clothier, M. S., *Head For. Dept., For.**R. P. Cope, B. S., (*Asst.*) *Chem.**Agnes H. Craig, B. S., *Head Home Econ. Dept.**H. T. Darlington, M. S., (*Asst.*) *Bot.**P. H. Dirstine, D. V. S., Ph. G., *Instr. Parasitol., Canine Diseases.**W. O. Ellis, M. S., *Instr. Ent.**C. E. Estes, Ch. E., *Chem. Analyst.**W. L. Ferguson, B. S., D. V. S., (*Spokane*), (*Asst.*) *Surg.**†Elton Fulmer, M. A., *Head Chem. Dept., Chem. (State Chem.).**†E. F. Gaines, B. S., *Instr. Agron.; Actg. Cerealist.*†D. C. George, B. S., *Asst. Plant Path.*†H. E. Goldsworthy, B. S., (*Lind*), *V. Dir. Dept. Dry Land Dem. and Expt.**†J. G. Hall, M. A., *Plant Path.**O. W. Holmes, B. S., *Instr. Dairy Husb.**†H. F. Holtz, M. S., *Asst. Soil Physicist.**C. L. Huff, D. V. S., (*Spokane*), *Instr. Meat Insp.**R. E. Hundertmark, B. S. A., *Instr. Dairy Prod.**C. H. Hunt, B. S., *Instr. Chem.**Leila W. Hunt, B. S., *Instr. Home Econ.*†Byron Hunter, M. A., *V. Dir. Washington Bureau of Farm Development (Coop. U. S. D. A.).**H. D. M. Jolivet, Ph. D., *Instr. Bot.**†J. W. Kalkus, D. V. S., (*Asst.*) *Path., Histol.; Asst. Vet.*†W. A. Linklater, B. S. A., *Supt. Substa., Puyallup.**V. O. McWhorter, B. S., *Instr. Ele. Agr.*†C. K. McWilliams, M. A., *Asst. Chem.**†C. A. Magoon, B. A., (*Assoc.*) *Bot.; Asst. Bact.**Elizabeth Matthews, B. S., (*Asst.*) *Foods, Cookery.**†A. L. Melander, M. S., *Head Zool. Dept., Ent.**Otto Menig, D. V. S., *Anat., Surg.**Clyde Meyers, A. B., *Instr. Ele. Agr.**†C. F. Monroe, B. S. A., (*Asst.*) *An. Husb.; Asst. An. Husb.**†O. M. Morris, B. S., *Head Hort. Dept., Hort.**†S. B. Nelson, D. V. M., *Vet. Sci.; Vet.**†A. B. Nystrom, M. S., *Dairy Husb.*†G. A. Olson, M. S., *Chem.**Alice G. Paterson, A. B., (*Asst.*) *Chem.**W. E. Ralston, B. S., D. V. M., *Physiol., Bact.*†H. L. Rees, A. B., *Plant Path., Puyallup Substa.*†Martha Richmond, *Libr.**†E. G. Schafer, M. S., *Agron.**George Severance, B. S., *Head Agr. Dept.**†W. T. Shaw, M. S., *Zool.**Solon Shedd, Ph. D., *Geol.**H. P. Shellabear, M. A., *Instr. Chem.*†C. B. Sprague, B. S., *Asst. Hort.*†J. L. Stahl, B. A., *Hort., Puyallup Substa.**B. L. Steele, M. A., *Phys.*†E. B. Stoekey, B. S., *Asst. Agron., Puyallup Substa.**Sadie J. Swenson, *Instr. Textiles.**†C. C. Thom, B. S. A., *Soils; Soil Phys.**C. C. Todd, B. S., *Chem.**J. A. Tormey, B. L., *Head Ext. Dept., Supt. Farmers' Insts.**†O. L. Waller, Ph. M., *V. Pres.; Irrig. Engin.**J. E. Weaver, M. A., (*Asst.*) *Bot.**E. E. Wegner, D. V. S., (*Assoc.*) *Vet. Anat., Surg.**V. V. Westgate, M. A., (*Asst.*) *Flor., Gard.**A. S. Wilson, *Libr.*†Horace Woolman, *Asst. Plant Path.**†M. A. Yothers, B. S., *Instr. Ent.; Asst. Ent.*†W. J. Young, M. S., *Asst. Hort.*

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College of Agriculture and the Agricultural Experiment Station of West Virginia University, Morgantown.

*College faculty. †Station staff.

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1 On leave.

2 Assumes duties July 1, 1914.

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 †D. C. Neal, B. S., *Asst. Plant Path.*
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 *A. R. Whitehill, Ph. D., *Gen. and Anal. Chem.*

The West Virginia Colored Institute, *Institute.*

*College faculty.

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College of Agriculture and the Agricultural Experiment Station of the University of Wisconsin, *Madison.*

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 *†G. H. Benkendorf, B. S., (*Asst.*) *Dairy Husb.; Asst. Dairy Husb.*
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 *†H. A. Drescher, B. S., *Asst. Agr. Chem.*
 *Clara M. Eckhardt, B. A., *Instr. Home Econ.*
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 *†E. H. Farrington, M. S., *Dairy Husb.*
 *†E. R. Finner, B. S., *Instr. Soils; Asst. Soils.*
 *Anna R. Fleming, *Instr. Home Econ.*
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 *†L. F. Graber, M. S., *Instr. Agron.; Asst. Agron.*
 *†Julia R. Grady, *Instr. Home Econ.*
 *†E. J. Graul, B. S., *Instr. Soils; Asst. Soils.*
 *†F. B. Hadley, D. V. M., (*Assoc.*) *Vet. Sci.; Vet.*
 *†J. G. Halpin, B. S., (*Assoc.*) *Poultry Husb.; Poultry Husb.*
 †R. T. Harris, *Asst. Dairy Tests (State Work)*.
 *†E. B. Hart, B. S., *Agr. Chem.*
 *†E. G. Hastings, M. S., *Agr. Bact.*
 *†K. L. Hatch, B. S., *Agr. Ed. Sec. Agr. Ext. Work.*
 *†C. S. Hean, B. A., *Libr.*
 *†W. A. Henry, D. Agr., D. Sc., *Agr. Emeritus.*
 *†J. R. Hepler, B. S., *Instr. Hort.; Asst. Hort.*
 *†B. H. Hibbard, Ph. D., *Agr. Econ. (Coop. and Marketing)*.
 *†A. W. Hopkins, B. A., *Agr. Journalism. Editor.*
 *†R. F. Howard, B. S., (*Asst.*) *Hort.; Asst. Hort.*
 *†G. C. Humphrey, B. S., *An. Husb.*
 †Heman Ibsen, B. S., *Asst. Expt. Brdg.*
 †G. R. Ingalls, Ph. B., *Eau Claire Co. Agr. Rep., Eau Claire (Coop. U. S. D. A.)*.
 *†A. G. Johnson, M. S., *Instr. Plant Path.; Research Asst. Plant Path.*
 *†James Johnson, M. S., *Instr. Hort.; Asst. Hort.*
 *†E. R. Jones, M. S., (*Assoc.*) *Soils; Assoc. Soil Phys.*
 *†L. R. Jones, Ph.D., D. Sc., *Plant Path.*
 †W. D. Juday, *Oncida Co. Agr. Rep., Rhinelander (Coop. U. S. D. A.)*.
 †J. C. Jurrjens, B. S., *Asst. Chem (State Feed and Fert. Insp.)*
 *G. W. Keitt, M. S., *Instr. Plant Path.*

¹ Assumes duties July 1, 1914.

- *†F. J. Kelley, B. S., *Asst. Expt. Brdg.*
 *†Frank Kleinheinz, *Instr. An. Husb.; Asst. An. Husb.*
 †A. R. Lamb, B. S., *Asst. Agr. Chem.*
 *†C. E. Lee, M. S., (*Asst.*) *Dairy Husb.; Asst. Dairy Husb.*
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 *†Henry Lunz, *Instr. Agron.; Asst. Agron.*
 †E. L. Luther, B. S., *State Supervisor of County Repts. (Coop. U. S. D. A.).*
 *†E. V. McCollum, Ph. D., (*Assoc.*) *Agr. Chem.; Agr. Chem.*
 *†E. R. McIntyre, *Instr. Agr. Journalism; Editorial Asst.*
 †O. G. Malde, *Supt. Cranberry Sta., Grand Rapids.*
 *†W. E. Markey, *Asst. An. Husb.*
 *†Abbey L. Marlatt, M. S., *Home Econ.*
 *†J. G. Milward, M. S., (*Asst.*) *Hort.; Asst. Hort.*
 *†J. G. Moore, M. S., M. H., (*Assoc.*) *Hort.; Hort.*
 *†R. A. Moore, *Agron.*
 *†F. B. Morrison, B. S., *Asst. to Dean and Dir. Agr. Chem. Work.*
 *†F. L. Musback, B. S., *Instr. Soils; Asst. Soils.*
 *†V. E. Nelson, B. S., *Asst. Agr. Chem.*
 *†C. P. Norgord, B. S., (*Assoc.*) *Agron.; Assoc. Agron. Supt. of Farmers' Insts.*
 *†A. C. Oosterhuis, M. S., *Instr. An. Husb.; Asst. An. Husb.*
 *†D. H. Otis, M. S., *Asst. Dean. Farm Mgt.*
 †F. D. Otis, B. S., *Barron Co. Agr. Rep., Barron (Coop. U. S. D. A.).*
 *Helen Parsons, B. S., *Asst. Home Econ.*
 *†W. H. Peterson, Ph. D., *Instr. Agr. Chem.; Asst. Agr. Chem.*
 *Anna Pfund, B. S., *Asst. Home Econ.*
 *†G. F. Potter, B. S., *Asst. Hort.*
 †R. L. Primm, *Asst. Agr. Bact.*
 †Griffiths Richards, B. S., *Price Co. Agr. Rep., Phillips (Coop. U. S. D. A.).*

- *†J. L. Sammis, Ph. D., (*Assoc.*) *Dairy Husb.; Assoc. Dairy Husb.*
 *†J. G. Sanders, M. A., (*Assoc.*) *Econ. Ent.; Nursery and Insecticide Insp.*
 †L. M. Schindler, B. S., *Asst. Agr. Engin.*
 *Celestine Schmit, (*Asst.*) *Home Econ.*
 †W. A. Schoenfeld, *Asst. Agr. Econ.*
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 *Luella M. Scoville, B. S., *Instr. Home Econ.*
 *†J. M. Sherman, M. S., *Asst. Agr. Bact.*
 *†Harry Steenbock, M. S., *Instr. Agr. Chem.; Asst. Agr. Chem.*
 *Laura M. Stewart, B. S., *Asst. Home Econ.*
 *†A. L. Stone, (*Asst.*) *Agron.; Asst. Agron. (State Seed Insp.).*
 *†W. H. Strowd, M. S., *Chem.; in charge Feed and Fert. Control Work.*
 †F. G. Swoboda, B. S., *Langlade Co. Agr. Rep., Antigo (Coop. U. S. D. A.).*
 *†H. C. Taylor, Ph. D., *Agr. Econ.*
 *†W. H. Tennant, B. S., *Asst. Agr. Engin.*
 *†J. L. Tormey, B. S., (*Asst.*) *An. Husb.; Asst. An. Husb.*
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 *†Emil Truog, M. S., *Instr. Soils; Asst. Soils.*
 *Annabel Turner, B. S., *Asst. Home Econ.*
 *Jenny A. Turner, *Instr. Home Econ.*
 *†H. W. Ullsperger, B. S., (*Sturgeon Bay*), *Instr. Soils; Asst. Soils.*
 *†R. E. Vaughan, M. S., *Asst. in Plant Path.*
 *†H. L. Walster, M. A., (*Asst.*) *Soils; Asst. in Soils.*
 *†W. W. Weir, B. S., *Instr. Soils; Asst. in Soils.*
 *†F. M. White, M. S., *in charge Agr. Engin.; Agr. Engin.*
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 *W. H. Wright, M. S., *Instr. Agr. Bact.*
 †Emily M. Zapata, B. S., *Asst. State Feed and Fert. Insp.*

WYOMING.

College of Agriculture and the Agricultural Experiment Station of the University of Wyoming.
 Laramie.

*College faculty. †Station staff.

- *C. A. Duniway, Ph. D., *President of University.*
 *†H. G. Knight, A. M., *Dean Coll. Agr. Dir. Sta. Agr. Chem. (*†) Supt. Farmers' Insts.*
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 *†J. A. Hill, B. S., *Textiles, Wool Specialist.*
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 *†S. K. Loy, Ph. D., *Chem.*
 †E. V. Lynn, M. A., *Asst. Research Chem.*
 *James McLay, *Instr. An. Husb.*
 †J. E. McWilliams, B. S., *Asst. Wool Invest.*
 *J. M. Mann, B. A., *Instr. Bot.*
 *†Aven Nelson, Ph. D., *Biol.; Bot., Hort.*
 *†T. S. Parsons, M. S., *Agron.*
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 *†J. W. Scott, Ph. D., *Zool.; Research Parasitol.*
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